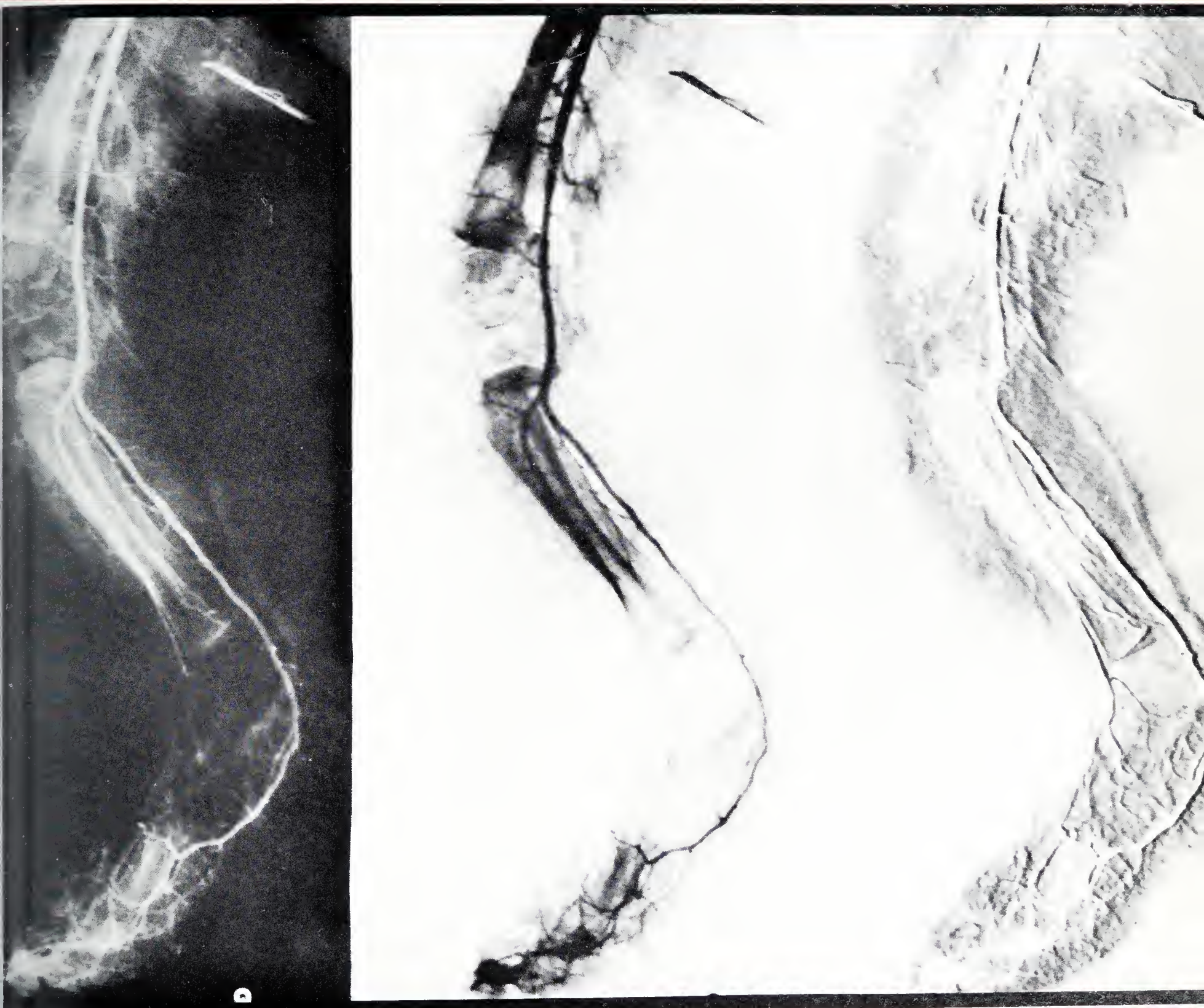
UNIVERSITY OF TORONTO MEDICAL JOURNAL



SURGERY

VOLUME XL
NUMBER 6
APRIL 1963

Soma maintains mobility as it eases low back pain

The addition of Soma to conservative therapy of low back syndrome helps produce prompt relief of muscle pain and stiffness and more rapid return to full activity. For Soma is an efficient muscle relaxant with pronounced analgesic properties, and thus attacks both phases of the pain-spasm cycle at the same time. In those who respond (as high as 87% in some studies) relief is noted within 30 minutes. Maximum effectiveness at continued dosage is usually achieved within 24 hours.

Soma is notably safe. For the most part, side effects are rare and of low order with drowsiness and dizziness the principal ones reported. Such effects may occur at the outset in 8 to 10% of patients but usually disappear as therapy continues. No adverse effects on respiratory, cardiovascular, hepatic, renal or endocrine systems have been reported.

COMPOSITION: Each white scored tablet contains 350 mg. of Carisoprodol. Bottles of 25 and 250.

the muscle relaxant with independent pain relieving action

Soma

CARISOPRODOL

DOSAGE: Usual adult dosage is one 350 mg. tablet 3 times daily and at bedtime.

FRANK W. HORNER LIMITED • MONTREAL

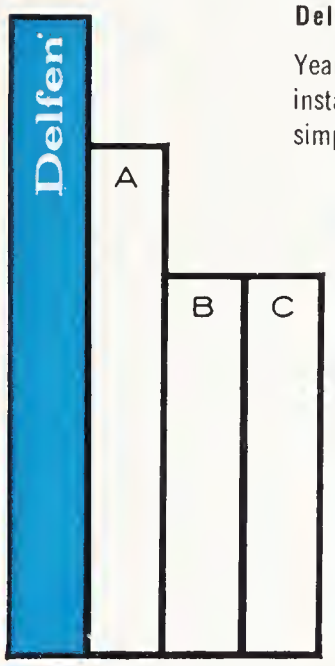
Delfen*
VAGINAL CREAM

ranks first in three leading tests of spermicidal potency[1]

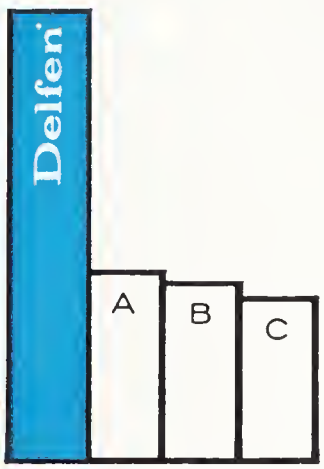
In a recent evaluation, by three laboratory techniques, of 54 commercial jellies and creams for the control of conception, (see below),

Delfen demonstrated highest spermicidal potency in all tests.

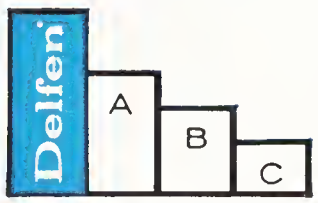
Years of clinical use, as well as these accurate tests, confirm the instant spermicidal potency of Delfen — the most effective yet simplest product available for conception control.



The Modified Sander-Cramer Test



The Mende-Berliner (Titration) Test



The Modified Brown-Gamble Technique

Since space precludes the representation of all 54 preparations, only the four leading products in each test are shown.

Reference: (1) MacLeod, J.; Sobrero, A., and Inglis, W.: In Vitro Assessment of Commercial Contraceptive Jellies and Creams, J.A.M.A. **176**:427-431 (May 6) 1961.

Ortho

*Trade Mark

ORTHO PHARMACEUTICAL (CANADA) LTD., TORONTO, ONT.

Sound, refreshing sleep — no after-effects next day with Placidyl*

(Ethchlorvynol, N.F.)

Used in Canada for more than six years as a non-barbiturate sedative-hypnotic with a fine record of safety, Placidyl is especially valued for its freedom from side effects, even in complicated situations.

Placidyl *gently* nudges the patient to sleep. It can be used safely throughout the pregnancy cycle. In the opinion of many surgeons, it approaches the ideal for pre- or postoperative sedation. It is suitable for aged or debilitated patients. It produces no respiratory depression, no disturbance of physiological responses. And it can be used at effective dosages over long periods with no untoward effects. *Placidyl* — for practically all patients with insomnia.

*Trade Mark Registered

ABBOTT

ABBOTT LABORATORIES LIMITED • Montreal • Toronto • Winnipeg • Vancouver

Index

Volume XL
Number 6
April 1963

EDITORIALS 218

Final Report
Imagination
Prospects

ARTICLES

THE DEPARTMENT OF SURGERY — *Frederick G. Kergin M.D.* 221
UROLOGY — *Wm. K. Kerr M.D.* 227
NOTES ON NEUROSURGERY — *T. P. Morley M.D.* 230
PLASTIC SURGERY — *W. K. Lindsay M.D.* 233
ORTHOPEDIC SURGERY IN TORONTO — *W. Robert Harris M.D.* 239
CARDIOVASCULAR SURGERY — *James A. Key M.D.* 242
GENERAL SURGERY IN TORONTO — *J. E. Mullens M.D.* 245
TRICHOBEZOARS — *Wayne Furlong* 6T4 250

FEATURES

ON INSPECTION 225
ANSWERS TO ON INSPECTION 252
RECENT ADVANCES 226
Data Acquisition and the Digital Computer in Medicine
PROFILES 236
Dr. F. G. Kergin
MEDICAL HORIZONS 249
Medicine in Tanganyika 1962 — *F. R. Manuel M.D.*
BOOK REVIEWS 232, 237
ABSTRACTS 229, 247

Renew your subscription to the U of T Medical Journal. *Special offer for class of* 6T3 251

THE COVER

Rather striking new techniques are being perfected in medical photography. One of these is base relief radiography. Shown on the cover are the three steps by which it is accomplished.

The original examination (left) was made during injection of the femoral artery of an infant. While this film provides sufficient diagnostic information, the anatomy vizualised includes structures other than those of prime interest. A copy of the original (centre) reverses the image and seems to have lost some of the irrelevant detail seen in the original. The base relief film (right) is the result of the superimposition of both the first two films. The anatomy in base relief is that for which the examination was made — the femoral arterial system.

Richard Harmse R.T.
Hospital for Sick Children.

INDEX TO ADVERTISERS

FROSST — Outside Back Cover
HORNER — Inside Front Cover
POULENC — Inside Back Cover
ORTHO 213
ABBOTT 214
SMITH, KLINE & FRENCH 216
JULIUS SCHMID 220
U. of T. BOOKSTORE 223
TAYLOR INSTRUMENTS 224
OSBORNE'S PHARMACY 241
HOMEWOOD SANITARIUM 244
WYETH 248
U. of T. MEDICAL JOURNAL 251

WHERE DOES BRAND-NAME QUALITY COME FROM?

Quality starts in the research laboratory. The intimate knowledge gained here — on drug action, toxicology, dosage and form — fashions the know-how of production.

Quality is preserved throughout the manufacturing process — by hundreds of tests and controls repeated over and over again with unerring accuracy for as long as the drug fulfills a medical need.

This is how potency remains constant, how purity is assured. This is why each dose a patient takes is identical with the next. This is reliability.

Employing these safeguards, the responsible manufacturer is ready to identify his product with a brand-name — his guarantee of quality.

ROBERT F. DAILY
General Manager

THIS IS
THE FOURTH
IN A SERIES
OF STATEMENTS
ON THE
RESPONSIBILITIES
OF A
PHARMACEUTICAL
MANUFACTURER

SMITH KLINE & FRENCH
MONTREAL 9

3324a

UNIVERSITY OF TORONTO MEDICAL JOURNAL

Volume XL November 1962 - April 1963

J. D. Graham 6T3
Editor-in-Chief

R. Baumal 6T3
Associate Editor
'Student Research'

J. R. Taylor 6T3
Associate Editor
'Blood'

G. A. McQuibban
6T3
Associate Editor
'General Practice'

R. Lee 6T3
Associate Editor
'Psyche'

J. L. Madigan 6T3
Associate Editor
'Nutrition'

D. R. Appert 6T3
Associate Editor
'Surgery'

S. M. Zweig 6T3
Assistant Editor
'On Inspection'

W. S. Crysdale
6T4
Assistant Editor
'Medical Horizons'

K. A. Ockenden
Managing Editor

F. Langer 6T4
Assistant Editor
'Abstracts'

J. M. J. Polak 6T4
Assistant Editor
'Profiles'

H. Tanzer 6T4
Assistant Editor
'Recent Advances'

P. K. McLeod 6T5
Business Manager

A. G. Logan 6T6
Advertising Mgr.

S. B. Presant 6T6
Circulation Mgr.

S. K. Bernstein
6T6
Assistant Business Manager

R. L. Walker 6T7
Assistant Advertising Manager

R. H. Smuekler
6T6
Exchange Director

D. P. Armitage 6T3
Photography

B. W. Pearson 6T6
Art

Editorials

FINAL REPORT

This issue marks the end of the publishing history of Volume XL. Many hopes and dreams have been fulfilled; some others have not. However much the Journal has increased in stature in the past few years, further improvement is possible and necessary. This task will now be left for future editors.

This year, because of a large financial obligation, steps were taken to reduce the cost of printing the Journal. A cheaper method of printing was employed and the size of the Journal was decreased to 40 or 44 pages per issue. By these measures, our debt of last summer was cut in half, and should be completely eliminated by the end of next year. The managing editor and his business staff deserve a great deal of credit for jobs well done. Prospective advertisers and subscribers however, will need a few more pushes next year, perhaps in the form of organized blitzes in the fall.

In spite of the financial cuts, the Journal prospered. Articles were, on the whole, fairly well written, but there is still a tendency in some to write as though they were taking lecture notes. A few went over the arbitrary five page page limit, but these were finally included after much hacking and condensing on the part of their authors.

In Volume XL, several new ideas were tried: new issue topics — *Student Research, Blood* and *Nutrition;* and new features — *Profiles* and *Medical Horizons*. Thanks go to the staff members who made these successful. Thanks are also well deserved by the rejuvenators of the old ideas — *General Practice* and *Psyche* issues, and *Recent Advances* and *On Inspection*. Our photographer laboured long to create pleasing effects on the covers, and our artist brightened up the editorial pages with his wit and skill. Editorials, two or three per issue were written by staff members and guest editorialists. We hope these have stimulated some thought.

Prizes for writing in the Journal were in a state of flux this year. Two prizes were awarded separately for Volume XXXIX, but judging for these will be combined for Volume XL. From one to three Parke-Davis prizes of $100 each will be awarded to students writing articles or features one page or longer. The faculty is divided into three groups for three possible prizes: 4th Meds, 3rd Meds, and the remainder of the faculty. To the best of these Parke-Davis winners will be awarded the $50 Webster Prize. All undergraduates are eligible except the editor-in-chief of the Journal. Prizes will be awarded for articles which combine the best use of the English language with the best organization and effort in preparation. The awards committee for Volume XL consists of Dr. H. V. Slemon, Dr. W. E. Hall and Dr. J. Olszewski, along with Dr. B. Charles and Dr. C. W. Harris from the Academy.

For Volume XXXIX, one Parke-Davis Prize was awarded, to R. O. Davies 6T2 for "Recent Developments in Diuretic Agents". Our thanks go to the consulting committee who made the choice: Dr. J. E. Hall, Dr. C. S. Anglin, Dr. J. B. McKendry and Dr. W. B. Spaulding. The Webster Prize, awarded annually by the Academy of Medicine, went to R. P. Humphreys 6T2 for "The Three Symptoms of Breast Disease." Our appreciation is shown to Dr. B. Charles and Dr. C. W. Harris for their work in choosing the winner.

"When all is said and done, when the battle's lost and won" (*apologies to W. Shakespeare*), its time for me to step down and let two very capable co-editors take over — Bill Crysdale and Fred Langer. My best wishes go with them and their successors for another profitable forty years of journalism. I am sure they will enjoy the work as I have.

J.D.G.

IMAGINATION

A university faculty department should be both a house of education and a house of research. However, its life should not take root solely in the mere knowledge conveyed to its students or solely in the mere opportunities for research afforded to the members of the faculty. Instead, it should attempt to preserve the connection between the knowledge and the zest of life by uniting the young and old in the imaginative consideration of learning. Information should be imparted but done so imaginatively.

However, the late Alfred North Whitehead felt that imagination was not to be divorced from the facts but instead was a way of illuminating the facts, and that this energy of imagination could in great measure be preserved through life if it were strengthened by discipline and experience. The task of a teaching department should be that of welding together into solid union both imagination and experience.

It was Napoleon who claimed that imagination rules the world; yet, he should have added that he who has imagination without learning has wings and no feet. With this thought in mind, we might further state that a taskful and purposeful teaching department (such as the Department of Surgery at the University of Toronto) should function in the preparation of all its students by promoting the imaginative consideration of the various general principles underlying that career during the undergraduate training years. Its students then pass into their period of technical apprenticeship with their imaginations already practised in connecting details with general principles. The routine then should assume meaning and also illuminate the principles which give it meaning. Hence, an imagination disciplined by detailed facts and by necessary habits should be the hall-mark of a properly trained man.

D.R.A.

PROSPECTS

To use a well worn cliché, medical students are now at the crossroads. At the present time, the medical profession is being subjected to both critical self appraisal and to intense public scrutiny. How will it emerge from this dissection?

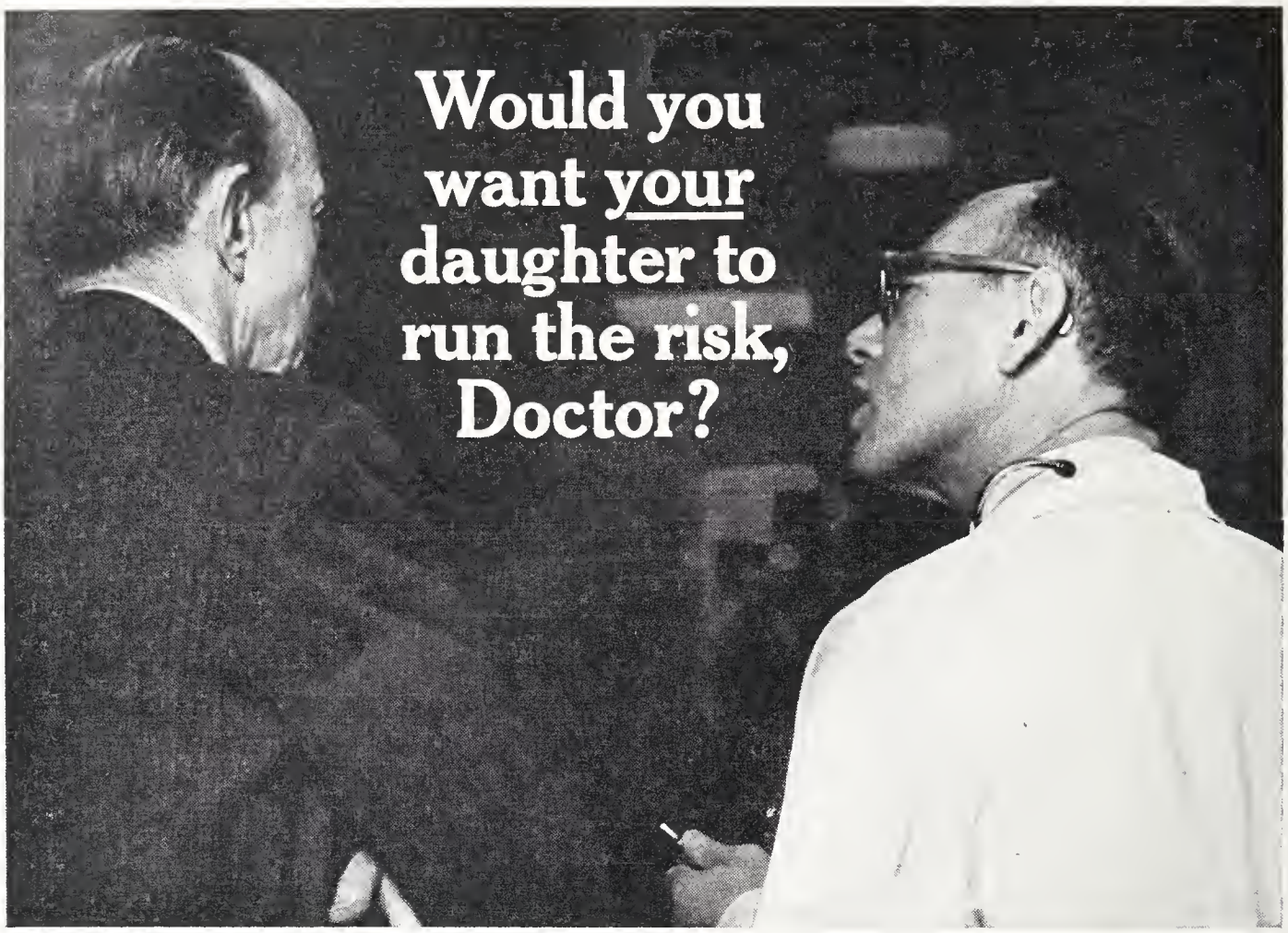
July of this year will mark the first anniversary of a serious intrusion by politicians into the Canadian practice of medicine. Those new democratic procedures, ostensibly benign, in reality represent a malignant invasion of man's personal liberties. In true political tradition, all parties are now advocating some form of state medicine. A few of the proposals are intelligent and have merit while others represent only a blatant bribe for power.

What can we do? The medical student of today must attempt to be cognizant of the various political philosophies expounded by the Canadian parties. He must try to understand and appreciate the different ideas emerging from the medical profession itself. He must be aware of the results from attempts at the practice of socialized medicine elsewhere in the world. But above all, he must remember that he is living in a North American country founded upon democratic principles and that free enterprise, capitalism, freedom of choice really are not dirty words. With these thoughts in mind, perhaps he may intelligently convince people that personal freedom is essential to the practice of good medicine.

This year, there are two editors-in-chief for the Medical Journal; F. Langer and Wm. Crysdale. The six associate editors are W. Weiser, S. Litch, S. Barron, H. Tanzer, S. McNeill, and R. Manktelow. A notice containing a list of the issue topics will be posted before the end of the school year; however, it now seems certain that the first issue, November, will concern student research. All efforts directed towards article writing will be most appreciated and will receive critical attention.

The recording of medical experience is an age old tradition and most essential to the sound practice of medicine. Viewing a self-produced article in print is a rewarding experience and infuses the author with a definite feeling of accomplishment. It is our desire that you will share with us this experience of creating and publishing worthy articles concerning medical phenomena. With these high hopes and good prospects, we look forward to the upcoming year.

Wm. S. C.



"No single doctor I asked [about a new contraceptive method] would advise his daughter to use it," said an expert on family planning who polled doctors recently at WHO headquarters.[1] Similar doubts about recommending new methods have been raised by others. "...it is quite impossible for anyone to say whether or not an ultimate risk is involved..." and "...the troublesome side reactions...will probably lead to discontinuation of the [new] method in no less than 25% of private patients."[2]

Why ask any patient to take a risk you wouldn't want your own daughter to take? When you recommend a RAMSES† Diaphragm and Jelly you are confident of safe, sure conception control *without risk of side effects or complaints.* With a record of better than 98% protection,[3] the time-proven diaphragm-jelly technique is safe and effective and needs only be used when precaution is required. *It is still the method best suited for the majority of patients.*

The COMFORT DOME, a unique feature of RAMSES Diaphragms, is so thin and light that its presence in use cannot be detected by either your patient or her husband. Yet this soft, velvet-smooth dome, which adds to sensitivity and enjoyment, is extra strong and durable. *There is a RAMSES Diaphragm to meet each patient's individual needs*—either the regular RAMSES Flexible Cushioned Diaphragm, suitable for most women, or the RAMSES BENDEX,† an arc-ing diaphragm. RAMSES Vaginal Jelly,* used with either type of RAMSES Diaphragm, provides further protection for ten full hours after insertion.

Elegant new RAMSES kit—designed with a woman in mind—compact and convenient.

1. Cadbury, George, at Third European Congress of International Planned Parenthood Federation, Warsaw, Poland, June 5-8, 1962. 2. DeCosta, E. J.: J.A.M.A. *181*:122 (July 14) 1962. 3. Tietze, C.: Proceedings, Third International Conference Planned Parenthood, 1953.

*Active agent, dodecaethyleneglycol monolaurate 5%, in a base of long-lasting barrier effectiveness.

†Trade-mark

JULIUS SCHMID PHARMACEUTICALS
32 Bermondsey Road, Toronto 16, Canada

The Department of Surgery

*Frederick G. Kergin**

It is with pleasure that the Department of Surgery has accepted, by invitation of the editors of the University of Toronto Medical Journal, the task of outlining its activities in the series of articles which appear in this issue. Representatives of the various special surgical interests which fall within the Department have written of the development of their specialty in this medical school and have made reference to the contributions of their predecessors. They have also given some indication of the present scope of their specialty and the direction which it may take in the future. It is my privilege to write of the organization of the Department, our under-graduate teaching programme and our graduate training course in surgery.

Unlike many universities, the University of Toronto does not own a hospital, but in fact it is unusually rich in teaching facilities through its affiliated hospitals. Under agreements between the University and the teaching hospitals, appointments to the staff of a clinical department in the hospital are made with the concurrence of the University and carry an appointment to the teaching staff of the appropriate department of the Faculty of Medicine. In the case of the Toronto General Hospital, the head of a clinical department in the Faculty also becomes chief of that department in the hospital.

The hospitals which are affiliated with the University for surgical teaching are the Toronto General Hospital, The Hospital for Sick Children, St. Michael's Hospital, the Toronto Western Hospital, the Wellesley Hospital, and the Women's College Hospital. Sunnybrook Hospital (Department of Veterans' Affairs) is not used for undergraduate teaching, but is important in the graduate training programme. Together, these hospitals comprise nearly 6,000 beds.

Over the past forty years a number of special surgical interests have evolved and in this medical school have remained as divisions within the Department. In order of development they are:— urology, neurosurgery, plastic surgery, orthopaedic surgery and cardiovascular surgery. To co-ordinate the teaching of general surgery and these specialties at the undergraduate and graduate level, there is a departmental committee for each specialty with representatives from each hospital which has developed the specialty division. Through these committees and a committee of the surgeons-in-chief of the teaching hospitals, close liaison is kept between the university department and the hospital departments of surgery which have the responsibility for the teaching and training.

**Frederick G. Kergin*
Professor and Head Department of Surgery
University of Toronto

UNDERGRADUATE TEACHING

Traditionally, the object of undergraduate teaching in medicine was to give the student a working acquaintanceship with all that was known of clinical medicine, so that, if he so wished, he could step straight from medical school into the world as a practitioner legally qualified to practise medicine, surgery and midwifery. Today this approach is patently unrealistic; it just is not possible, in three short academic years devoted to clinical work, to acquire the knowledge and skill required to practise medicine efficiently on this broad front. The student before being granted his licence, must accept further training in the form of a rotating internship, the content of which is laid down in broad terms by the College of Physicians and Surgeons. Also, it is recognized that a minority of the graduates will enter general practice; others will train in a specialty, some will make a career of research, an appreciable proportion will undertake institutional work in hospitals, government departments, industry or join the armed forces. A growing concept is that undergraduate medical education should produce the "basic doctor", equipped with a foundation of knowledge on which he can build a structure of special skill in one of the many careers in medicine, one of the most important of which, for the community, will continue to be family practice.

How is this concept interpreted in the teaching of surgery? It means that we no longer think in terms of teaching students how to do operations or even of expecting them to know technical details of how they are done. Students in the earlier years of their course have learned of the normal structure and function of the human body. In the Department of Pathology they have learned the natural history of disease and of the effects on bodily function of disease processes. In the wards of the hospital they have an opportunity to examine the living individual, to recognize the variations of normal, and to detect the variations which fall outside the normal range. They learn to elicit from the patient a word-picture of the abnormal

sensations he experiences, to relate this to the abnormalities found on examination, to know what laboratory procedures may add useful information and how to interpret the results of these tests. The student then correlates this information to arrive at a conclusion in regard to the disease process which has led the patient to seek medical help. In general terms he learns what can be done for these patients; that many diseases can be cured by specific therapy, and that practically all others may be alleviated.

All this can be considered as reasonable equipment for the basic doctor to carry with him into his internship, where, for the first time he has real responsibility for the care of patients. The accuracy of his observations and conclusions may influence the future health and welfare of a fellow human being.

How are the thoughts expressed above implemented in the teaching programme of this Department? In the second medical year there is a lecture series designed to relate knowledge of the basic sciences to abnormalities of function produced by injury or disease. Emphasis is placed on the reactions of the body to injury and infection. In the wards of the hospitals the students learn how to examine patients with special reference to those disorders which commonly require surgical treatment.

Before entering the third medical year students have completed their course in pathology. Teaching now embraces the whole range of those diseases which commonly require surgical treatment. The emphasis is on diagnosis and an understanding of the principles followed in therapy. For one term all surgical teaching is given by the staff of the Hospital for Sick Children.

In the final year, one term is spent on the surgical wards of one of the teaching hospitals. During this period the students have an opportunity to follow their own patients through the whole programme of investigation and treatment. The bulk of their time is spent on the general surgical wards; but appropriate periods are set aside for experience in the specialties. During the final clinical years there is a gradual transition from the principle of teaching to that of learning. In the final year the responsibility for acquiring knowledge rests almost exclusively with the student.

Limitations of space will not permit a more detailed discussion of what is being attempted in our teaching programme. Much of it is traditional. Like most other medical schools ours is examining the curriculum in a critical manner. My own belief is that we must recognize the segmentation of medicine and surgery into areas of special interest, chiefly on the basis of anatomical systems, and the resulting development of inter-departmental teams working together and in collaboration with basic scientists, pathologists, radiologists and experts in other disciplines to explore the causes of disease, and to perfect diagnostic and therapeutic methods. In the future, teaching will be on this basis, without rigid division into "medical" and "surgical" lectures and clinical demonstrations.

POSTGRADUATE TRAINING

In 1931 the late Professor W. E. Gallie introduced a planned training course for surgeons at the Toronto General Hospital with an arrangement for rotation of the trainees through an assistant residency at the Hospital for Sick Children. "The Gallie Course" was the first of the kind in Canada and anticipated many of the training courses which have been developed in the United States.

In 1947, under the guidance of Professor Robert Janes, the course was broadened to include all the teaching hospitals. This made it one of the largest training courses, from the point of view of numbers of surgeons in training, in North America, if not in the world. At the present time about twenty appointments to the course are made each year and there are over ninety surgeons in training.

Opportunity is provided for training in general surgery and in each of the five specialties previously mentioned: urology, neurosurgery, plastic surgery, orthopaedic surgery and cardiovascular surgery. The various programmes are designed to more than meet the requirements of the Royal College of Surgeons of Canada. They consist of at least four, and more often five years of training beyond rotating internship. During this period, the "core" training in the specialty is usually obtained in one of the hospitals but rotation appointments are held in one or two others.

The training in general surgery includes periods, usually of six months, as assistant resident on a number of the specialized services. Those who are training in the specialties receive at least a year of training in general surgery. Almost all trainees have six months of pathology.

Approximately two-thirds of the trainees spend one year in a research appointment. This may be spent in experimental surgery under the guidance of a member of the department, in a basic science department or in clinical research. This year is particularly recommended for the trainees in the specialty divisions and for the general surgeons who have academic aspirations. The trainees who expect to practise out-

side a major centre are given as broad an experience in clinical surgery as possible and are not encouraged to spend a year in basic science.

Applications for this training course are received from graduates of all the medical schools in Canada and, each year, a great number of applications are received from graduates of schools outside Canada. In considering these applications the Committee for Appointments is interested in: the applicant's performance as an undergraduate, the report on his work as an intern and, where possible, the impressions gained in an interview. The undergraduate record is important. This training course is not organized on a pyramid principle. The men who are accepted are expected to be carried through the entire training course, and to progress up the ladder of responsibility to resident status. This calls for more than average ability, energy and ambition. Furthermore, they are all expected to pass the Fellowship examination of the Royal College. Experience has shown that if a person has never done well in his examinations as a student, he is likely to have difficulty with the Fellowship examination. Repeated failure in that test, after four or five years of training, would be tragedy.

What do we recommend to a student who thinks he might like to become a surgeon? He is invited to call on the head of the department during his final year to talk over his plans. He is wise to intern in one of the teaching hospitals so that we may obtain a first-hand report on his work. He should request that his rotation in surgery be given early in the year and should indicate to the staff surgeons, or at least to the head of his surgical service, that he is interested in an appointment to the course. If a definite decision is made to apply for training, he should see the head of the department not later than September 30th of the year before he hopes to start. At this time a formal application is completed and there is an opportunity to discuss a possible training programme.

Although most of our trainees have their entire clinical experience in this course, there is an opportunity, from time to time, for men to come into training in one of the surgical specialties after acquiring acceptable experience in general surgery elsewhere. This depends on whether or not the specialty training posts are already earmarked for men who have been accepted for training in that particular specialty and are in the preliminary phase of training in general surgery.

The management of a training course like this is exceedingly complicated. There is the problem of trying to choose the right men and the occasional woman for an arduous course of training, of sometimes recognizing that the choice was wrong and that a trainee should drop out, of the individual who decides part way through that he wishes to change to a different surgical specialty, of trying to meet the wishes of ninety-odd people in regard to the timing and order of their appointments, and finally, of keeping them all moving forward to positions of increasing responsibility. One cannot think about it and write about it without wondering whether it is accomplishing its purpose, to supply this country with a continuous stream of highly trained young surgeons. One obvious criterion is success in the Fellowship examinations of the Royal College of Surgeons. That test of success is reassuring; our candidates have an exceedingly high rate of passing. It is even more reassuring, and a source of pleasure and pride, to look over Ontario, and across Canada, and to note many leading surgeons have trained in the teaching hospitals of this university. Dr. Gallie's dream has been more than fulfilled.

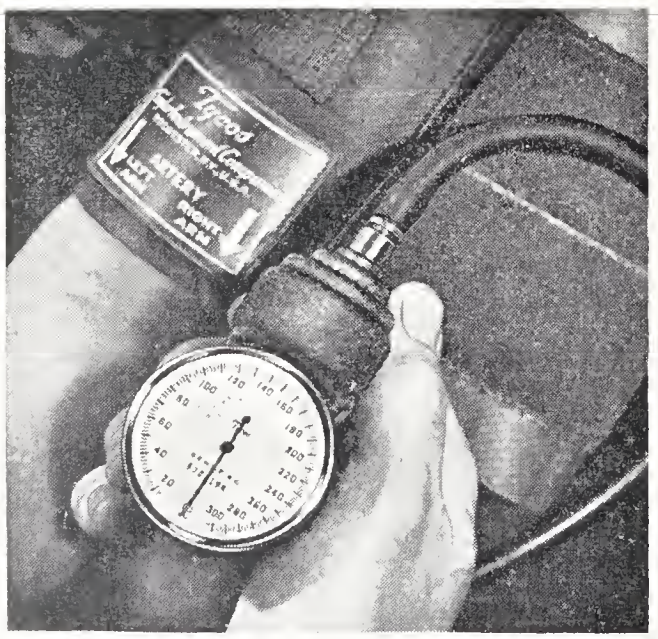
on the front campus

UNIVERSITY OF TORONTO

BOOK DEPARTMENT

Text and reference books
Microscopes at reduced student rates
Stationery supplies
Complete lines of quality paperbacks
Periodicals of scholarly and topical interest
Hours 9–5 daily

"Nurse, will you please leave . . . even a Tycos Aneroid can take only so much!"



Like most doctors we have known, this one considers a sense of humor one of the most valuable tools of his trade. Another one, of course, is his TYCOS Aneroid. The TYCOS name is synonymous with accuracy and dependability. Has been for over 50 years.

The popular Hand Model shown here is perfect for both house and office calls. Inflating bulb and air release valve are built right into the back of the gage. Single tube with Luer lock fitting permits applying cuff before attaching gage. Complete with leather case and either hook or new Velcro 80 cuff, $52.00. TYCOS Pocket Model Aneroid, complete with case and cuff, $49.00. Ask your surgical supply dealer for a demonstration. Taylor Instrument Companies of Canada Limited, 75 Tycos Drive, Toronto 19, Ontario.

Taylor Instruments **MEAN ACCURACY FIRST**

On Inspection

S. M. Zweig 6T3
D. P. Armitage 6T3

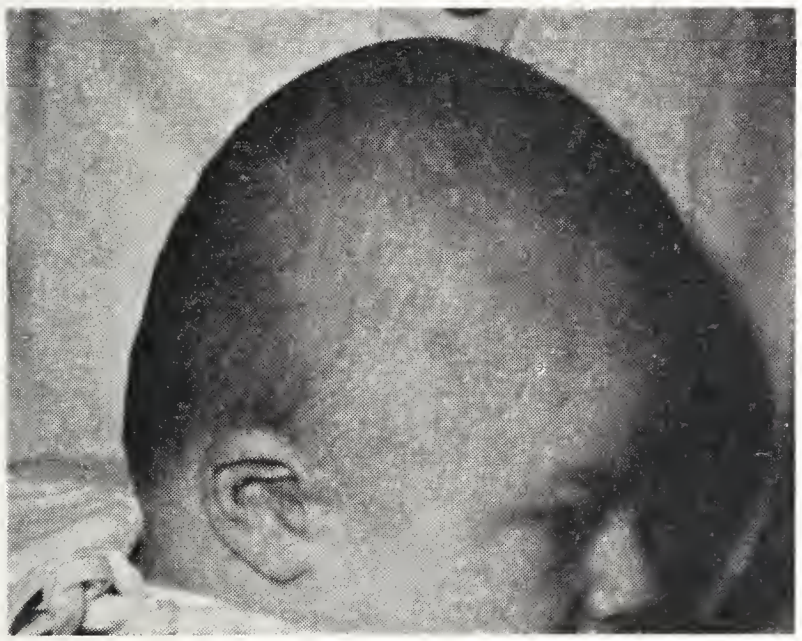


FIGURE 1: Note the shape of the skull. What is this surgically correctable condition called?

FIGURE 2: Disregard the attire. Identify and name the surgical manipulation which has been performed.

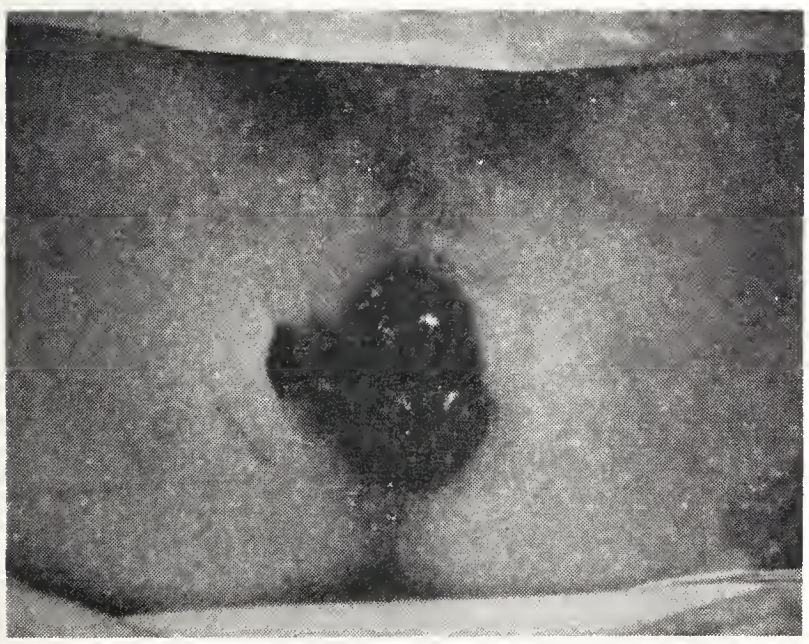


FIGURE 3: There need be no clues for this common condition; most medical students have a less severe variety.

FIGURE 4: This is a not uncommon disfiguring surgical complication. Take a guess.

See page 252 for answers

Recent Advances

DATA ACQUISITION AND THE DIGITAL COMPUTER IN MEDICINE

In the last issue (U.T.M.J. March '63), a basic outline of the mechanism and use of the digital computer was presented. An example of its use in searching and correlation follows.

Instructions are given to a computer to determine the number of cases of heart disease in 150 seemingly well, asymptomatic persons. Twenty-nine with heart disease are noted by the machine on the basis of history, positive physical signs or both. The machine is now instructed to determine the correlation of a number of conditions for example, to locate the record of the patient (if any) with all of the following conditions. A white(1) man(2) between 40 and 50 years of age(3), who might have known he had hypertension(4) but who did not know he had heart disease(5). He must have had cardiac enlargement, with the left ventricle at least 1 cm. beyond the midclavicular line(6) and a pulse with normal sinus rhythm less than 90 per minute(7) and a second aortic sound greater than the pulmonic component(8). The prostate had to be firm and slightly enlarged(9), the hemoglobin not less than 14.0 gms.(10) and a urinalysis showing a specific gravity greater than 1.020(11) but negative for albumin(12) and with glycosuria(13) and occasional pus cells(14). A patient with the above 14 conditions if present is found and his record is given along with what percentage of the group he constituted. It is possible to correlate up to 50 or even more such conditions.

The application of computers in searching and correlation of data covers a wide variety of topics from the computer diagnosis of ventricular hypertrophy in children, to the use of the digital computer as a teaching machine for medical students. Many such topics were presented at the Rochester Conference on Data Acquisition and Processing, the proceedings of which will soon be available.

One of the most interesting papers in this field of data acquisition (although not utilizing a digital computer system) was presented at this conference by an engineer from I.T.T. Federal Labs, San Fernando, on a *Patient Monitoring System*. This monitor, operating on transducers, is used for following the physiological status of critical, post-operative patients. The monitor unit is mounted at one end of the bed and plugged into an ordinary wall socket. The panel of the monitor displays the vital signs: blood pressure, respirations, temperature and heart rate. The monitor indicates the value for this patient and compares this value with high and low quantitative values which the physician sets as normal for this patient. This provides an *immediate continuous* assessment of the patient and also produces a 12-hour chart which may be stored with the patient's record. The value of this device in terms of rapid assessment of a critically ill patient and nursing staff time is obvious.

The tremendous capacity for remembering, of the larger digital computer makes it a valuable tool in clinical patient care and investigation. It does not take the place of the clinician but rather assists in search and correlation of larger quantities of data than could be found or correlated prior to its invention. This technique supplemented by the use of magnetic tape may be the solution to the problem of medical record storage, not only from the aspect of decreased physical space requirements but also, of greater import, from the aspect of retrievability. It allows the clinician to pose a statement of conditions, up to 50 or more in number, simultaneously for one search of a vast store of medical records, and produces an answer in seconds. At the same time it will tally the number of occurrences among these patients of up to 1000 additional facts and data. The retrieved data is presented to the physician rapidly and in typewritten form. It permits the researchers to carry out months and even years of work in minutes or hours.

For those interested in the rapidly progressing field of computation and medical data acquisition, I would recommend *the Rochester Conference on Data Acquisition and Processing in Biology and Medicine* to be held on July 15, 16 and 17, at the University of Rochester Medical Centre, Rochester, New York. The theme of this year's conference is *"Biomedical Computing"*.

H. Tanzer 6T4

Urology

*Wm. K. Kerr**

The antiquity of urology is concretely attested by calculi found in burial grounds thousands of years old. Hippocrates said: "Thou shalt not cut for the stone", knowing well that the delicate equilibrium between associated infection and local host resistance would be upset and fatal sepsis would ensue. Soft tissue lesions are not as likely to be preserved for archeological periods. An exception to this is the extraordinary preservation of mummies in the dry climate of Egypt where in recent years a gynecologist has found a five thousand year old vesicovaginal fistula in one of Pharaoh's dancing girls! Not all that is antique is necessarily held in esteem and the modern urologist has sometimes had to struggle hard in order to raise himself above the humble lot of drawers of water and hewers of stone. The gratitude of his patients however has never lacked.

Prior to World War I operations on the urinary tract were still part of the armamentarium of the general surgeon; notable among those was the operation devised by George Armstrong Peters for transplantation of the ureters into the rectum by the extraperitoneal route in children born with extrophy of the urinary bladder. However, in Toronto, as elsewhere, surgery of the urinary tract became organized as a specialty only after 1918, and it was the first specialty of surgery to be so recognized.

Warner Jones established the division of urology at the Toronto General Hospital along with London-trained Robin Pearse and with J. C. McClelland and R. A. McComb, both trained in Baltimore. These men were responsible for reducing the appaling mortality of prostatectomy from 50 per cent to under 5 per cent between World War I and World War II. They pioneered cystectomy and transplantation of the ureters into the bowel for bladder cancer, and made this a national center for urological surgery. They were also responsible for the formation of the Canadian Urological Association which brought urologists across Canada together into a common society, particularly the French Canadian School.

D. R. Mitchell shortly before World War II was to introduce research into the field with studies on Mandelamine and the early sulphonamides in urinary tract infection as well as analyses of urinary calculi. Gordon Foulds at St. Michael's Hospital played a distinguished part in establishing urology as a specialty in Toronto, and A. I. Willinsky at the Toronto Western Hospital was prominent in introducing endoscopic surgery on the prostrate, now the standard treatment in the majority of cases.

As well as technical advances, this period also witnessed the foundation for teaching of urology in Toronto. This has since then become the most important training center for the specialty in Canada and compares favourably with any center in the world in this respect.

UROLOGICAL DEVELOPMENTS

In the period after World War II, considerable development has taken place. It should be noted that not all development was originated by urologists or conducted solely by them. Much credit goes to general surgeons still interested in aspects of urology, physicians gravely concerned with medical aspects of renal and urinary tract disease and others. Teamwork with other clinical spheres and association with basic science disciplines has been very profitable in the past and will remain indispensable to progress in the future.

Prostate Gland

Prostatectomy must be mentioned because it is the keystone of urological surgery. Were it not for the trouble and specialized care required for this operation, the likelihood is that the remainder of urological surgery would have rested at least for a long time in the domain of general surgery. As it is practised here, the mortality of about 1 per cent seems creditable enough, but the incidence of complications of hemorrage and infection and later imperfect urinary control still leaves room for improvement.

It is hoped that the future may bring some medical treatment which will prevent or reverse the physiological hypertrophy of the prostate gland attending the advancing years of men. It is a curious but as yet unexplained fact that the tracer metal zinc, a prosthetic metal for many enzyme systems, is many times more plentiful in the prostate than elsewhere in the body. Zinc might be to the prostate what iodine is to the thyroid, and a conceivable key to the riddle of benign prostatic hypertrophy.

Carcinoma of the prostate is of course a unique malignancy. There is a very high incidence of latent histological cancer, 20 per cent in males over 50

**William K. Kerr*
Division of Urology
Toronto General Hospital

years, only a few of which develop clinically. It is also the first form of cancer for which there is a specific chemical blood test, namely the acid phosphatase level; it is this quantitative parameter of the disease which has led to the important discovery that the tumour is hormone dependent and can be controlled to an impressive degree by the administration of the female sex hormone Stilbestrol.

Investigation

The role which investigation of the urinary tract plays in the practice of urology is perhaps second only in importance to prostatectomy, or perhaps even as important, insofar as urology is concerned. To the long accepted procedures of cystoscopy and pyelography (indispensable in the diagnosis and management of both medical or surgical urinary tract disease) have been added such techniques as aortography, perirenal air insufflation, needle biopsy of the kidney and prostate, elaborate differential kidney function tests and more recently cinefluorographic studies of urinary tract dynamics. Also radioactive isotopes are increasingly applied to uptake and clearance tests of the kidney and geographic scanning of the organs. Several of these new tests have been pioneered here while others are slower in being adopted.

An outstanding feature of the specialty of urology will always be the increasing precision and accuracy of diagnostic techniques applied not only to surgical but also medical conditions of the urinary tract, in both cases often in close collaboration with physicians interested in diseases of the urinary tract. The eventual surgical removal of a kidney or a stone or repair of a renal artery (by a vascular surgeon) sometimes becomes a mere technical incident in the overall management of the patient's disease.

Renal Hypertension

This is surely not the third most important aspect of urology! It is as a matter of fact a very important field at this particular center and one in which important contributions have been pioneered here and a field which exemplifies what has been said already about application and development of new diagnostic methods and has as well been the result of close collaboration with physicians. In fact it is to the internist that we owe the opening up of a whole new field of urological surgery. It is almost 30 years ago that the pathologist Goldblatt produced experimental hypertension in dogs by applying a clamp on the renal artery. After a few years, occasional kidneys were removed in the hope of relieving hypertension in patients, but because of the lack of diagnostic criteria the results were uncertain. A useful differential renal function test was conceived which immediately was found to be very accurate in establishing that a kidney was ischemic and that surgical removal of the kidney or repair of the artery would relieve hypertension. Aortography, which had first been introduced to Canada here, almost simultaneously was applied to demonstrate the arterial lesion or lesions. Many newer tests and elaborations have sprung up, but the basic differential sodium and volume excretion test and aortography still remain the all important diagnostic tools in uncovering cases of renovascular hypertension. An obscure physiological discovery led to a new clinical entity where surgical methods of treatment have found application to a medical disease. Lengthy and painstaking tests on many patients have been rewarded by such significant results that diagnostic work in the cystoscopy suites is of equal interest to the work in the operating room.

Other Clinical Progress.

A major postwar surgical advance was the medical care and rehabilitation of the paraplegic patient, stimulated by returning casualties of World War II. Neurosurgeon, orthopod, plastic surgeon and urologist all integrated by a physician versed in physical medicine formed a team which raised a poor incontinent and involuntary bed-ridden invalid to wheel chair or crutches and home life, and even gainful employment and financial independence. The urological task was to provide continent or contained urinary drainage and reduce sepsis and destruction of renal function. Long term results however are still far from ideal; in fact, some of the complications like vesicoureteral reflux threaten the prolonged maintenance of renal function. Research on this has lead to the discovery of similar defects in urinary dynamics in other patients, notably children with recurring cystitis and pyelonephritis. Investigation of such patients will soon entail cinefluorographic and pressure and flow recordings at various sites of the urinary tract in order to direct the surgeon to correct diagnosis and treatment. Earlier detection may even permit simpler corrective measures and possibly obviate difficult and uncertain surgical procedures.

The establishment in Toronto of a full time pediatric urological service has already resulted in considerable advance in the treatment of congenital and other urological disorders in children and more important has stimulated research which will result in new knowledge applicable not only to children but to adults as well.

Study of renal tuberculosis was begun in Toronto by an orthopedic surgeon 35 years ago, a urological service in the Weston Sanatorium soon followed and

mortality has fallen from 50 per cent to less than 1/3 per cent with modern drug treatment. This center has long been recognized as world authorities in this disease. Healing is still often attended by so much scar tissue however that the bladder has to be largely replaced and expanded by segments of the intestinal tract. Ileo- or colocystoplasties were first developed on these patients after the impetus of French surgeons. Surprisingly the bowel segment adapts itself very well to contingent storage of urine. The future of course lies in earlier diagnosis and treatment and prevention altogether.

Other clinical fields of endeavour include: radical thoracoabdominal operations for malignancies of the kidney, replacement of the entire bladder and prostate for cancer by a segment of bowel connected to the membranous urethra, retroperitoneal lymph node dissection from inguinal ring to the diaphram for testicular tumour and other procedures of a technical surgical nature.

EXPERIMENTAL RESEARCH

The first urological research laboratory in Canada was established here not many years ago. This example has been followed now in most major centers in Canada. Projects have ranged widely from topical application of radioisotopes in the prostate for carcinoma, zinc distribution in benign and malignant prostates, electrolyte and water exchange in the bladder wall and in segments of bowel used to replace portions of the urinary tract, topical cancerocidal drugs in the bladder, effect of infection in producing vesicoureteral reflux, experimental production of renal hypertension, a thermal exchange method of determining renal blood flow and an elaborate project on the urinary carcinogens of bladder and kidney tumours. Most of this investigation is conducted by research fellows under direction as an optional part of their course of training in urology.

A problem of wide interest is transplantation of the kidney in man. It is an organ susceptible to disease in an otherwise healthy young person and being a paired organ with a simple large vascular pedicle, lends itself better than any other organ except skin to transplantation from a living donor. In fact it has been done successfully on probably 50 patients about the world but always on identical twins. In others immunity against the kidney results in rejection.

Work in this broad field begins with the management of renal failure. In acute reversible cases hemodialysis with an artificial kidney is possible. Gordon Murray developed the first successful model on this continent. Now it is managed by a largely medical team. The next step is to help the chronic uremic now being attempted variously by repeated hemodialysis, peritoneal lavage and intestinal perfusion. So far success is limited and that only in marginal cases. Finally, there is the patient who really does require another kidney. Hitherto attempts at modifying host rejection have been directed at the host. Bombarding the bone marrow with total body radiation or drugs so far only delays rejection and then only by keeping the host's bone marrow depressed to a point eventually incompatible with life. Attention is now being turned on the graft, to see if it may be modified. Hence our own interest in experimental perfusion of the isolated dog's kidney. If it can be kept in an artificial but still physiological state it might be treated or incubated to alter its genetic antigenic properties and be accepted by a new host.

Abstracts

Complications of Steriod Therapy. Rance, Bain, Boone. Wolfish. Bulletin of Hospital for Sick Children Vol. 10 4th. quarter, 1961.

The following complications occur in children

1) sudden, unexpected death.
2) hypertension and convulsions.
3) emotional disturbances.
4) adrenal suppression with lack of response to stress.
5) diabetes mellitus.
6) growth suppression.
7) electrolyte imbalance.
8) failure of wound healing.
9) response to infection.
10) gastro-intestinal bleeding, peptic ulceration and perforation.

F.L.

Rupture of the Diaphragm associated with multiple injuries; J. Tennessee M.A., 55:144-148, 1962.

Diagnosis is based on 5 clinical signs: prominence or immobility of the left hemithorax, displacement of the heart to the right, no breath sounds in the left chest, gurgling sounds in the left chest, and tympany in the left lower chest on percussion. Injuries involving crushing of the abdominal viscera and fractures of the bony pelvis and/or lumber spine are the commonest cause of dehiscence of the diaphragm, occurring most frequently in automobile accidents. Emergency surgical intervention is the best treatment. The abdominal approach lends itself to a more thorough exploration.

F.L.

Notes on Neurosurgery

*T. P. Morley**

A Hospital Perfectly Complete

I have subtitled this article with a phrase taken from the annual report of the Board of Trustees of the Toronto General Hospital on the eve of a major building programme in 1906: the construction of what is now the old building facing College Street. It expressed, with disarming simplicity, the Board's conviction that to live up to the public's expectations the hospital should be able to provide *every* service within the competence of modern medicine. The note struck by the Board set the tone of the clinical medical school in the succeeding decades, and we heed its echoes today. The flowering of any specialty comes only after cross-fertilization with other skills. There is a danger in isolation, a threat to vitality. Ingenuity may be misused on the nurture of freaks.

It is not a question of specialists versus non-specialists. Everyone is a specialist nowadays, if you take as your qualification an inability to encompass all knowledge. But there ought to be an interlocking between the specialties so that advance in one inevitably agitates the others. It is this interdependence on each other that preserves our honesty, disturbs our complacency and creates "a hospital perfectly complete".

DEVELOPMENT OF NEUROSURGERY IN TORONTO

Urology was the first specialty established in the Department of Surgery. Shortly afterwards came neurosurgery under Dr. K. G. McKenzie. This was the first neurosurgical service to be created in Canada. Dr. McKenzie, after studying under Cushing, introduced into Toronto the clinical skills that had been handed down personally from Hughlings Jackson to Victor Horsley and thence to Harvey Cushing. With each transference they were refined. Nowadays, hard pressed by the demands of technological advances, we do not easily maintain the standards of clinical skill that we inherited.

A study of the neurosurgical bibliography gives a fairly accurate impression of what in the past have been the issues of the day. If the pages of this journal are turned back to 1928, the reader will discover what Dr. McKenzie thought the undergraduate should know about the surgery of the central nervous system. During the inter-war years and during the war when he was single-handed while Dr. Botterell was overseas in the R.C.A.M.C., Dr. McKenzie enlarged the scope of clinical neurosurgery in such fields as the treatment of Ménière's syndrome by the division of the vestibular component of the ninth cranial nerve, the application of Sjöqvist's observations on the anatomy of the trigeminal pathways to the treatment of trigeminal neuralgia (the fact that this work led to the abandonment of the operation of quintothalamic tractotomy for the relief of tic douloureux does not detract from its importance), and the surgical treatment of spasmodic torticollis, to name but three subjects.

It is impossible to review this phase of the specialty in Toronto without acknowledging its dependence on neurology (Dr. Goldwin W. Howland and Dr. R. G. Armour and later Dr. H. H. Hyland) and neuropathology (Dr. E. A. Linell and Dr. Mary I. Tom).

At the time that Dr. W. S. Keith was founding paediatric neurosurgery in Toronto at The Hospital for Sick Children, Dr. E. H. Botterell was persuading Government at all levels that the lack of a satisfactory organization to help the paraplegic patient should be corrected. Out of that came the active treatment beds for the care of paraplegic patients at Sunnybrook Hospital, Lyndhurst Lodge Hospital for the rehabilitation of the paraplegic, and the Paraplegic Association. The initial stimulus was the war and the immediate need to provide continuing care and supervision of the returning paraplegic veteran. Inevitably, because they were good, the arrangements were extended to help paraplegic civilians. Now, under Dr. A. T. Jousse, the organization of resettlement and long-term surveillance is so well known that it is unlikely that anyone is passed by who would benefit from the services provided. Not least amongst these services are those the patients give each other through their own Paraplegic Association.

The opening of the new quarters for the Neurosurgical Division in the Central Building of the Toronto General Hospital in 1958 was the culmination of many years of careful planning by Dr. McKenzie and his successor, Dr. Botterell; planning which had been solicited and fostered by the Board and Administration of the Hospital and by the University. At the same time a neurosurgical service had been established at St.

**T. P. Morley*
Division of Neurosurgery
Toronto General Hospital

Michael's Hospital under Dr. W. J. Horsey, and the neurosurgical facilities at the Toronto Western Hospital under Dr. W. S. Keith were being greatly expanded. Meanwhile, Dr. E. B. Hendrick's arrival at The Hospital for Sick Children allowed the neurosurgical unit there to be enlarged to 60 beds.

NEUROSURGICAL TEACHING IN TORONTO

For different but inadequate reasons neurosurgery in many schools has not been given the place in undergraduate teaching it deserves. Partly this has been due to the scornful attitude of neurosurgeons themselves who believed their calling to be loftier than teaching students. I sometimes wonder if more than clinical skill has been handed down from our famous predecessors in the specialty. Was it not Horsley who acidly remarked, "I am not here to teach you elementary facts which you can pick up from other people"? Partly, too, this neglect is due to the specialty losing the perennial struggle for an adequate place on the curriculum. Equally significant is the rarity of a neurosurgical question on the examination papers.

At Toronto most of these faults have been avoided. From the earliest days of the specialty the neurosurgical staff has been conscious of its responsibility towards the training of a doctor. It has been hoped that every man at graduation knows how to recognize an acute extradural intracranial haematoma and how to treat it in an emergency. The alternative, a journey of perhaps many hours to a neurosurgical centre before initial treatment can be given, so often ends in death. Similarily, the quality of immediate treatment of injuries of the spine and cord bears directly on the final outcome. The continuing appearance (happily decreasing) in our wards of the grave complications of "neurosurgical" conditions shows that not all the lessons have yet been successfully taught or learned.

Postgraduate neurosurgical instruction is an increasingly important part of the teaching programme. It is planned not only for men taking up neurosurgery for a career but also for any surgeon who expects to have to treat nervous system trauma — and what surgeon can turn his back on that aspect of his work? But not only trauma is involved here. It is no less desirable for a neurosurgeon to have a working knowledge of other branches of surgery and medicine than for his colleagues to know what his training has fitted him for. The "generalist" narrows his outlook by neglecting his specialist colleagues as surely as the specialist's vision dims if he retreats behind his castle walls.

THE COURSE OF NEUROSURGERY

Ever since Victorian times a major preoccupation of neurologists and neurosurgeons has been with methods for accurately localising intracranial disorders preparatory to their exposure at operation. The compelling demands of modern neurosurgery have inspired the inventiveness of clinicians to bring to their help any technical device available that will ensure the accurate placement of the incision in scalp and skull. The triumph of clinical localisation by anamnesis and physical examination was a major advance, based as it was on sound neuroanatomical and neurophysiological observation. It was the *coup de grâce* which eliminated phrenology just as it was getting into its stride; no longer was there any excuse to indulge in the type of speculative wandering which appears to us so improbable that we marvel it had such a vogue.

But even with the uncanny diagnostic precision of men who had only their wits to rely on, anatomical localisation of disease was sufficiently inaccurate to make each operation a fearful uncertainty for patient and surgeon alike. The radiological demonstration by Walter Dandy (at Halstead's instigation) of the diagnostic value of air injected into the cerebral ventricals was therefore acclaimed with gratitude, and neurosurgery took another step forwards.

During the next two decades similar advances were made by the injection of contrast media, air or iodine-containing fluids, into the cerebrospinal fluid pathways of the cranium and spinal canal, and by intra-arterial injection of suitable contrast fluids to demonstrate the arrangement of the intracranial arteries, veins and sinuses. These diagnostic techniques have been a mainstay of neurosurgical practice. With them the accuracy of anatomical localisation of appropriate lesions is better than ninety-five percent. They have put the surgeon within reasonably comfortable reach of tumours and many varieties of traumatic, inflammatory and congenital disorders.

The war, as always, helped surgery's cause in certain directions, but at the end of it the practice of neurosurgery was much the same as it had been at the beginning. It is in the years since the war that we have seen advances which compare in importance with the first successful removals of brain tumours in the last quarter of the nineteenth century or with the demonstration of pneumoventriculography just after the First World War. I refer to the treatment of intracranial aneurysms by direct approach to give lasting protection against recurrent rupture, the surgery of cerebral ischaemia due to obstruction of any of the great vessels supplying the head, the surgical treatment of Parkinson's disease and other disorders of locomotion, hypothermia as an aid to certain neurosurgical procedures and the development of new diagnostic techniques to localize accurately the site of intracranial disease with-

out the hazard inherent in pneumoencephalography and arteriography. This last has been accomplished in two ways: through the use of gamma-emitting radio-isotopes which can be incorporated into tumours and other cerebral lesions in sufficient concentration to be detected by scintillators held near the surface of the head, and by means of ultrasonic echoes to plumb the depths of intracranial interfaces from the scalp.

The early promise shown by the use of hypothermia in protecting the brain from the effects of temporary arrest of cerebral circulation during operation on aneurysms and other vascular disorders of the brain has been fulfilled. This arose from the adaptation to neurosurgery by W. M. Lougheed of W. G. Bigelow's important fundamental work on the implications of reducing body temperature. At present the various techniques of local or regional cooling are under study whereby only that part of the body (e.g. the brain) which is to be submitted to surgical manipulation is cooled. The essence of these techniques is in the deflection of the arterial blood supply through a cooling system before the blood is delivered to the part.

This is not the place to make a detailed survey of all the neurosurgical activities of the Department of Surgery; for that, the annual report of the Dean of the the Faculty should be consulted. But the scope of clinical and laboratory research to which the University neurosurgeons, frequently with the cooperation of other departments, are committed can be judged from this list: a comprehensive study of head injuries in children; the comparative anatomy and physiology of the basal ganglia in vertebrates; the surgical relief of involuntary movement due to extrapyramidal disorders; the natural history of arteriovenous malformations of the brain and their response to surgical treatment; arterial patching; the use of radio-isotopes in the localisation of intracranial lesions; the factors responsible for the uptake of isotopes by intracranial lesion; the clinical trial of a new and potent analgesic; regional hypothermia; the use of by-pass procedures in hydrocephalus; basic studies of hypothalamic function. The catalogue could be lengthened by intruding into those fields where neurosurgery plays a necessary but subordinate part.

Teaching, clinical investigation and fundamental research of this extent is indeed the outcome of specialisation. But I hope that I have shown that specialisation can and should be the very antithesis of narrowness and introspection. Although neurosurgery is the example in point, it would have been as apt to examine any other specialty in the Faculty.

I dare not guess what lies ahead for neurosurgery here or elsewhere. If I knew it would already be in the past. But future's form will be shaped by diligence and watchfulness, intuition and logic, humility and fortitude, rest and pain.

Book Reviews

Fundamental Skills in Surgery, T. F. Nealon; W. B. Saunders Co., Phila.; 289 pages, illus.; 1962; $9.20.

In adition to a good bedside manner, the next best way to win a patient is to perform routine procedures with skill and confidence. Students and internes are not taught these 'tricks of the trade' in lectures, and must pick them up as best they can, usually by word of mouth.

Recognizing this need, Dr. Nealon has collected much of this elementary but very useful information. Material in the book is generally limited to basic procedures, but this goal has been exceeded in certain acute problems and areas in which the author is particularly interested.

Starting with preoperative preparation and postoperative complications, the author goes on to detail operating room equipment and conduct, including the exclusive operating room sign language. Suturing, wound dressing, and the use of local anesthetics follow. General principles are outlined for trauma, burns and infections as well as minor surgical procedures. After this, chapters are devoted to various procedures involved in certain areas or systems such as the hand and urinary tract. The book ends with an excellent chapter on resuscitation.

Fundamental Skills in Surgery is strongly recommended for students and internes, and even those in practice may find a few fresh approaches. It is one of the very few books of its kind, and helps the neophyte doctor to open the doors of medical and surgical experience a little wider.

J.D.G.

Auscultation of the Heart, R. W. D. Turner; E.S. Livingston through the MacMillan Co. of Canada, Ltd.; 42 pages, paper back; 1963; $0.65.

This primer for budding cardiologists outlines, in a logical manner, heart sounds, triple rhythms and murmers. The author offers hope for those who hear 'nothing' and 'everything' when listening to a heart. His approach involves a careful analysis of each of the sounds heard, along with an understanding of the underlying mechanisms.

J.D.G.

Plastic Surgery

*W. K. Lindsay**

Plastic surgery is the branch of surgery dealing with the restoration and healing of congenitally deformed, wounded, disfigured or unsightly parts of the body. It includes both functional and cosmetic or esthetic considerations not necessary related to the health or safety of the patient. Perhaps the use of such terms as *reconstructive, reparative* or *restorative* surgery would be of more descriptive value. The word plastic in its classic sense means "giving form or fashion to matter". This word, as used in plastic surgery, bears no relationship to synthetic or plastic materials.

Plastic surgery, unlike the other surgical specialties, cannot be defined in terms of a body region or system. It has been erroneously nicknamed the surgery of the skin. Because it is not confined to a body system or a group of anatomical structures, and because of the role it plays in all the other surgical specialties, it can be considered a *way of surgery* rather than a *specialty of surgery*. In essence it has become the sole remaining true form of general surgery. It is common to speak of applying the principles of plastic surgery to whatever surgery one may be doing.

HISTORICAL EVENTS

Plastic surgery, in conjunction with midwifery and ophthalmology, is considered to be one of the oldest medical specialties. Throughout the several thousand years of medical writing, probably as far back as the Egyptian school of 1600 B.C., certainly through the Hindu, Chinese, Greek, Arabian and early Italian schools of medicine, there have been distinct references to techniques of restoring structure and form. Many of the techniques and manoeuvres in common use today were described in those eras. However, it was Edward Zeis (1807-1868) who brought much of this early reconstructive work together under one cover — *Handbuch der Plastischen Chirurgie,* published in 1838; this textbook marked the origin of the term *plastic surgery*.

During the formative years of the specialty of plastic surgery in Toronto, a number of general surgeons developed special interests and abilities in the management of individual conditions, or groups of conditons, which have subsequently come to lie within the broad sphere of plastic surgery. Examples of these are: the contribution of Dr. J. H. Couch to the surgery of the hand; the work of Dr. A. B. LeMesurier with harelip and cleft palate patients; the technical manoeuvres of Dr. H. W. Wookey for reconstruction of the neck and hypopharyngeal region after radical resection of that area; the technique and value of atraumatic surgery as taught by surgeons such as Drs. D. W. G. Murray and R. M. Janes.

Nevertheless, the evolutionary history of plastic surgery is essentially the story of the treatment of war wounds of single combat. And the principles of wound healing and plastic repair of difficult body areas, learned by the urgency of war, were subsequently applied to the treatment of severe injuries and visible body defects in the civilian population. The development of Toronto plastic surgery parallels considerably this historical pattern: —

The 1914-1918 War provided a high proportion of cranial-facial injuries because of the trench warfare. Under the guidance of Mr. Gillies (later to become Sir Harold Gillies), the British Army established a Jaw and Face Unit at Sidcup, England. One of the Commonwealth surgeons invited to participate actively in this unit was Dr. Fulton E. Risdon.

Dr. Risdon was at that time both a graduate doctor of dentistry and of medicine from the University of Toronto, and he had become particularly interested in the reconstruction of deformities of the head and neck. Subsequent to his return from England to Toronto — now with vast experience — he became the first Toronto and the first Canadian plastic surgeon. Indeed he was to become a founding member of the first plastic surgery organization in the world, the American Association of Plastic Surgeons, and of the American Board of Plastic Surgery. Since 1920 he has been a staff member of the Toronto Western Hospital where he has interested many people in his work (including Drs. A. R. Tilley and L. T. Barclay). He is the revered father of Canadian plastic surgery.

Dr. W. E. Gallie, in 1930, saw the need for surgeons trained in reconstructive surgery and made arrangements for two young general surgeons, Dr. S. D. Gordon and Dr. A. W. Farmer to study in England with Sir Harold Gillies for one year. Both of these surgeons returned to Toronto in 1932 to practice plastic surgery as well as general surgery in their respective institutions, the Toronto General Hospital and The Hospital for Sick Children. Before World War II there were three plastic surgeons in Ontario, Drs. Risdon,

**W. K. Lindsay*
Division of Plastic Surgery
The Hospital for Sick Children, Toronto

Gordon and Farmer, but once again a war was to change the plastic surgery picture.

The Royal Canadian Army Medical Corps, remembering World War I experience, in 1941 established a special unit for plastic and reconstructive surgery at Basingstoke, England. Dr. S. D. Gordon was the officer in charge and Drs. L. T. Barclay and H. H. Campbell also served in this unit. In 1942 the Royal Canadian Air Force established a special plastic unit (the R.C.A.F. Plastic Surgery And Jaw Injury Unit) at East Grinstead, England, attached to the Queen Victoria Hospital with Dr. A. R. Tilley as officer in charge. A large volume of patients received major reconstructive surgery at these two Canadian service units.

Dr. A. W. Farmer, by virtue of his position as Chief Consultant in Surgery to the Royal Canadian Air Force, saw the need for specialty surgery in the armed services and the Department of Veterans Affairs particularly in the event of large scale casualties. Therefore, with D.V.A., the R.C.A.F., in 1943 formed a plastic surgery unit at Christie Street Hospital. Dr. J. V. R. Ord was its first surgeon soon to be joined by men from the other services. This led to the concept of the joint service use of specialists across Canada.

This war experience together with the post-war training programme has increased the complement of Toronto plastic surgeons from three to fifteen, seven of whom are on the University of Toronto staff; Drs. S. D. Gordon and D. C. Robertson, at the Toronto General Hospital; Drs. A. W. Farmer, W. K. Lindsay and H. G. Thomson at The Hospital for Sick Children; Drs. L. T. Barclay (retired) and W. A. Brown at Toronto Western Hospital; Dr. H. H. Campbell at St. Michael's Hospital and Dr. A. R. Tilley at Wellesley Hospital.

SCOPE OF PLASTIC SURGERY

The scope of plastic surgery has varied from time to time and from one geographical area to another because of the broadness of this way of surgery. It was for a number of years synonymous with skin grafting but this has become a technique of surgery applicable to all fields. In some centres plastic surgeons, often as team members, reconstruct the defects made of necessity by the excisional surgeons. In other areas they both excise and reconstruct. In some centres plastic surgery tends to be synonymous with cosmetic surgery. A number of the operations done by plastic surgeons are done ostensibly for reasons of beautification alone. In actual fact even these operations have functional considerations, namely: social acceptability, patient drives and self-confidence, habilitation and rehabilitation.

Most plastic surgery is exacting but satisfying. Apart from involving complicated manoeuvres and fine atraumatic technique it demands a knowledge of what the tissue will stand and what any one procedure will accomplish. It demands an ability to assess and understand the reaction of the patient. All the work one does is visible and can be readily criticized or accepted by the patient. The work and the results involve both functional and esthetic considerations in various combinations.

Plastic surgery patients fall into four groups. (1) Those patients with injuries and deformities, congenital or acquired, of the face and jaws that may alter the shape of the bone structure, leave disfiguring scars of the soft tissues, or result in abnormal function or physiology. Some of these lesions require the work often called maxillo-facial surgery. This comprises a large group of lesions involving the scalp, face, eyelids, nose, lips, ears and jaws. (2) Those patients with injuries and deformities of any part of the body that require free skins grafts, pedicle flaps, scar adjustments or special care and re-adjustment of the surface tissues. (3) Those patients with serious burns who will ultimately require extensive restoration of surfaces but may, from the start, benefit from the care of a person familiar with their many other problems. (4) Those patients wishing or requiring cosmetic surgery who must be considered part of plastic surgery with the recognition that they could become a happy hunting ground for the charlatan and quack.

Hand surgery warrants special mention. The anatomical structures of this region, the covering tissues, nerves, tendons, bones and joints are more intimately related than any other place in the body. It is here that we find the best example of the value of atraumatic surgery and of the concept of the inter-relationship of the reaction of tissues to injury, complex clinical function and the reaction of the patient. Toronto plastic surgeons have done much to improve the surgery of this region.

TORONTO CONTRIBUTIONS

Specialization within the field of surgery developed slowly in the University of Toronto teaching hospitals. General surgeons did plastic surgery and plastic surgeons did general surgery until relatively recently. There were important contributions to the field of plastic surgery by Toronto general surgeons.

Drs. W. E. Gallie and A. B. LeMesurier added to the world's knowledge of the fate of transplanted tissues with their animal studies of free fascial grafts. They used this material as a *living suture* for the repair of difficult hernias and similar technical problems.

Dr. A. B. LeMesurier devised and popularized an operation for harelip. His work produced a rebirth of interest in the surgical correction of this deformity. The standard of his results are still so high that none can reach them as consistently as he did. This work culminated in the recent publication of a specialized textbook on the subject. Dr. LeMesurier's care of cleft palate patients has produced speech results which have yet to be surpassed.

Dr. Couch stimulated intense consideration and respect of the injured and infected hand culminating in the publication of his textbook, the first single author textbook to be published by a Toronto clinical surgeon. It is quite possible that this stimulus made Toronto the leading centre in Canadian hand surgery and much respected in American hand surgery groups.

The clinical and scientific contributions of Toronto Plastic surgeons are worthy of note. Dr. F. E. Risdon actively stimulated interest in the reconstructive surgery of congenital and acquired deformities of the face and jaws. The Risdon approach to the temporo-mandibular joint is still considered a milestone. The Risdon method of applying dental wires to fix the jaws following fracture and reconstructive procedures has stood the test of time.

Dr. S. D. Gordon has carried out considerable basic work on transplanted tissues. The studies with Dr. A. W. Ham on the fate of free bone grafts where it was shown that cancellous bone survived in small areas close to a good supply of blood but in the main bone grafts did not survive but served as a framework into which primitive host osteoblastic tissue grew, stands as a monumental and much quoted piece of work in the tissue transplantation literature. Dr. Gordon also studied the manner of vascularization of free skin grafts and pedicle flaps using fluorescent and other techniques. More recently he has studied techniques of storing free skin grafts by refrigeration, and with Dr. J. A. Key, the use of such grafts for major vessel replacement. Dr. Gordon also studied the manner of vascularization of free skin grafts and pedicle flaps using fluorescent and other techniques. More recently he has studied techniques of storing free skin grafts by refrigeration, and with Dr. J. A. Key, the use of such grafts for major vessel replacement.

Dr. Gordon's fifty-one publications can be used to illustrate his special interests as well as something of the sphere of Toronto plastic surgery. They include papers related to actinomycosis, melano-carcinoma, rodent ulcer, Dupuytren's contracture, scleroderma, facial injuries with emphasis on fractures of the mandible and the maxilla, temporo-mandibular joint disorders, decubitus ulceration, methods of improving finger tendon action, and thermal burns.

Dr. A. W. Farmer has contributed voluminously to the basic scientific and clinical aspects of plastic surgery. His studies of the burn problem, done frequently in conjunction with Dr. W. R. Franks (Banting Best Research Foundation) and later with Dr. S. H. Jackson (Biochemical Department of The Hospital for Sick Children) as well as a number of junior investigators, are comprehensive, and include work on a number of methods of managing the acute burn wound, pressure dressings and related basic factors, Vitamin C and adreno-corticoid metabolism, and specific burn toxins and abnormal protein metabolism. His clinical investigative work includes numerous publications arising from a large, well cared for, well documented series of burn patients from the extremely active burn service at The Hospital for Sick Children.

Dr. Farmer's clinical publications again serve to illustrate both his work and the spectrum of plastic surgery. They are perhaps highlighted by papers on the management of complicated soft tissue wounds, frequently with associated bone, tendon, and nerve involvement. His concept of the management of avulsion soft tissue injuries continues to stimulate world wide interest. Of particular note is his use of the ingenious composite cross leg pedicle graft to correct congenital pseudarthrosis of the tibia. Papers on the more severe congenital defects of the extremities include those on congenital absence of the radius, the ulna, the tibia, and the fibula. His concept of the operative management of hypospadias patients is original. Another piece of work included collaboration with Dr. B. Fearon of the Ear, Nose and Throat Department in the use of free skin grafts for oesophageal replacement following lye burns.

Dr. L. T. Barclay retunred from World War II with vast experience in the management of burn patients and applied his meticulous methods to these patients and those suffering from other soft tissue injuries. His papers on reconstruction of the external genitalia following traumatic loss are excellent. His management of problematic statis ulceration was much respected.

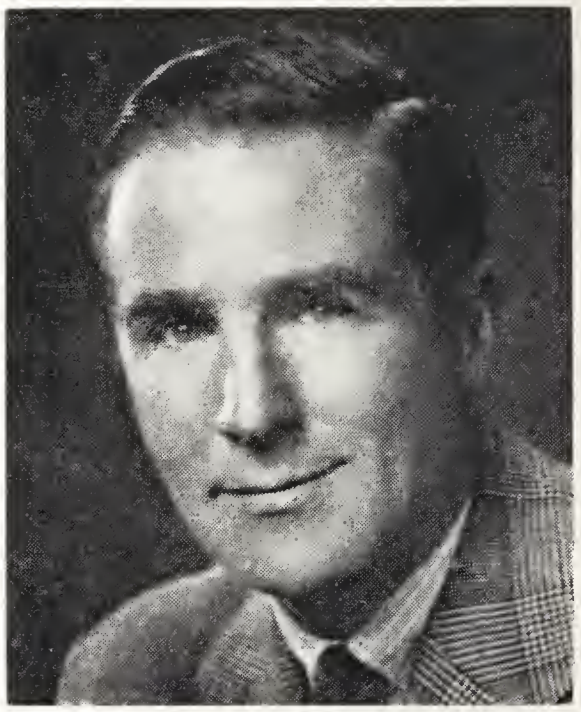
Dr. H. H. Campbell returned from World War II with similar experiences superimposed on a broad surgical training in a number of specialties. He has been particularly interested in the management of the deep malignant tumours of the maxillary, nasal and ethmoid regions.

Dr. D. C. Robertson has pubished work on the management of the burned hand, soft tissue and flexor tendon injuries in the hand, and cranio-facial separation injuries. Dr. W. A. Brown has contributed academically and clinically to the management of malig-

See page 236

Profiles

Dr. F. G. Kergin



Dr. Kergin comes from a family which has given many of its members to the medical profession, including his father, who graduated from Toronto University in 1902. He himself was born in Port Simpson, B.C. in 1907 and took his high school education in that province. Coming to this city he first took the course in Biological and Medical Sciences, and then went on to take his M.D. in 1930. He graduated with honours and was a Silver Medallist.

Following a junior internship at the Toronto General Hospital, he was selected as Rhodes Scholar for British Columbia. He studied physiology and anatomy at Magdalen College at Oxford and took a "first" in the Honour School, leaving with an M.A. He subsequently spent two years as Senior House Surgeon for TGH and HSC, and then retunred to England for further work in surgery at St. Bartholomew's Hospital and the Hospital for Women, Soho Square. Prior to the outbreak of World War II he was Resident Surgeon at the TGH and later was also on staff at that hospital.

From 1939 until 1945 he served overseas with the Royal Canadian Army Medical Corps, in Great Britain, North Africa and Northwest Europe. He was mentioned in dispatches, and retired with the rank of Lieutenant Colonel. For twelve years following his discharge he was on the Teaching Staff in Surgery of the University of Toronto, and on the Surgical Staff of the TGH. He was also a consultant in Thoracic Surgery to the Toronto Hospital for Tuberculosis and the Niagara Peninsula Sanatorium. He was a Hunterian Professor and Lecturer in the Royal College of Surgeons of England in 1955.

In 1957 he was made Professor of Surgery and Surgeon-in-Chief for the Toronto General Hospital. Presently he is Consultant Surgeon to several hospitals in Toronto, and St. Catharines. He is a Fellow of the Royal College of Surgeons of England and Canada, and also of the American College of Surgeons. He holds membership in many professional societies. His surgical specialty is that of the thorax, in particular pulmonary surgery, and its attendant problems in tuberculosis. He has written many papers both in his field and in general surgery.

Dr. Kergin is married and has one son who is now studying at this university. His position is a very time consuming one, but his fondness of the outdoors takes him away each year for hunting deer and trout fishing, and he is also very fond of skeet shooting. He is a man widely respected on many fronts, for his professional teaching, and for his personal qualities which both his ability both as administrator and surgeon, for his patients and those he works with admire.

Jarda Polak 6T4

Continued from page 235.

nant tumours of the head and neck, maxillo-facial injuries and the care of hand injuries. Dr. W. K. Lindsay has undertaken basic and clinical studies of the factors relating to the repair of digital flexor tendon injuries and has worked closely with the development of a multidiscipline group to care for cleft lip and palate patients.

THE FUTURE

The plastic surgery services associated with the University of Toronto will continue to function in three general ways. (1) Researeh will continue, particularly in the vast unknown field of the reaetion of the body to burning, the fate of grafted tissues, and the reaction of tissues to injury and surgery. (2) There will be greater emphasis on the habilitation and rehabilitation of patients with residual deformities. (3) The principles of plastic surgery will be taught to the trainees proceeding to higher degrees in their respective surgical specialties; this in itself will contnue to limit the growth of plastic surgery as a pure specialty because individuals in the other specialties will become more familiar with the principles and techniques of reconstructive surgery and will tend to apply them to their own specialties; pure plastic surgeons will be trained in keeping with the supply of qualified trainees and the demand for this specialty.

Book Reviews

The General Practitioner; Kenneth F. Clute, Ed. First Edition, 1963. University of Toronto Press, 566 pages. $12.00.

Early in 1956 the College of General Practice of Canada enlisted Dr. Kenneth Clute to direct a survey of general practice in Canada. Financial aid for such an ambitious undertaking came from National Health Grants, the Canadian Life Insurance Officers Association, and the Rockefeller Foundation. On January 19, 1963 was published the results of this survey in a book entitled *The General Practitioner.* In his own preface Dr. Clute states, "During the past six years my associates and I have been privileged to have such a view of general medical practice, at first hand, as no one in this country has ever had before or, for reason of cost, is likely to have again. . . ."

The survey is exhaustive and gives a thorough study of medical education and practice in Ontario and Nova Scotia. The book is oragnized under three broad sections entitled the General Practitioner, The Work of the General Practitioner, and Problems of Medical Education and of Medical Practice. Its 26 chapters probe deeply into the general practitioner's background, arrangements for practice, finances, quality of work, hospital privileges, community responsibilities, and other vital aspects too numerous to mention in a brief review. This detailed study, although including only 86 general practices, took great care in the selection of sample practices, and statistical technique was applied strictly and objectively.

Of particular interest to medical students are the chapters dealing with undergraduate education and postgraduate hospital training. The general practitioners' criticisms of the medical course dealt with subject matter and with the quality of the teaching. The clinical work was repeatedly criticized on the ground that there was not enough practical work. They complained that too much emphasis was put on the rare and obscure conditions, while too little attention was paid to the common conditions. About the preclinical subjects, the major complaints were that there was too much material or that it was covered in too much detail; that in some cases, the material was poorly organized, and that certain laboratory courses were unsatisfactory. Dr. Clute's comments on these criticisms are well taken. He recognizes the immediate need for the medical curriculum to be subjected to a critical, detailed examination. It is suggested that the student be made to accept a greater amount of responsibility for his own education, and that greater emphasis be put on a student's reading, and that adequate time be made available for this. In addition, the choice of teaching staff should be determined by teaching ability rather than research ability, and these physicians should receive adequate remuneration for their work in order to reduce the amount of time given to their practices, and subsequently prepare teaching material beforehand.

One could continue to comment on the contents of this book, but it is sufficient to say that the survey is intelligently and competently presented, and that it should form the basis of a constructive inquiry into the training of the general practitioner.

Since its publication, much controversy has been directed toward Dr. Clute's book, because it has been addressed to the medical and the non-medical reader alike. Reviewers had filed their stories several days in advance of the sale date, and rights to reproduction have been purchased by newspapers from the publisher. It is the authors contention that "the public, since it will share with government and with the medical profession the responsibilities for future medicine, will have need of all the information that can be laid before it, if it is to choose wisely."

This view has been severely questioned by a considerable number of Dr. Clute's colleagues, and it has undoubtedly upset many of medicine's sacred cows. Times have changed, and fewer and fewer people today regard the doctor as a man with supernatural powers. He is judged as a fallible human being subject to mistake and error. It is unfortunate if the medical profession is so conservative as to be reactionary in some respects. Patterns of practice and methods of education must adapt themselves to the needs of the contemporary students and practitioners. However, I do not feel that this book should be assimilated by the lay public. It was meant to be an introspective research report to help the profession improve its standards. To this end, it is immensely useful, but as a public document, it will undoubtedly be used in the support of prejudice. Medical care has unfortunately become a political apple, chiefly because our esteemed politicians, both medical and otherwise, are filled with a burning desire to perpetuate their own existence.

G.A.M.

Cell Physiology, 2nd Ed., by Arthur C. Giese, Ph.D., W. B. Saunders Company, Philadelphia 1962, 592 pp., $12.45.

Cell Physiology is patterned after a set of lectures delivered by Professor Giese to his biology class at

Stanford University. It describes in simple language and in bold outline the major problems of cellular function. Professor Giese reveals a refreshing understanding of the undergraduate's needs in this easily read work. The presentations are neatly organized in a readily comprehended pattern, points are made clearly and concisely, and psuedo-scholarly digressions into areas of conflict or historical background are avoided. Simple illustrations, line diagrams and photographs are included only insofar as they further illuminate the complex subject of cellular mechanics.

You will be delighted with the manner in which this book brings together the relevant principles of physics, biochemistry, zoology, histology and physiology to present a lucid and coherent picture of the living cell. The subjects I mentioned are taught to us as separate disciplines in Toronto, and for many of us, a workable integration of the important aspects of each (with respect to living organism) is never achieved. This book has the delightful quality of recalling to us the material we cursed in our early physics courses, for example, and transforming it at long last into something meaningful and useful in terms of our understanding of the living protoplasmic entity.

The book is organized into six sections. They deal in turn with the functional organization of the cell, the cellular environment, exchange of materials across the cell membrane, conversion of energy and matter inside the cell, irritability and contractility, and growth and cell division. By reserving discussion of the history of cell physiology for a final brief chapter (chapter twenty-seven) on this specific topic, Giese renders the scientists their due without impeding the students' attempts to comprehend their findings in the earlier chapters of the book.

As an example of the previously referred to synthetic approach of the book, the section on irritability and contractility includes in its substance the physics of impulse conduction, the histology of nerves and the different types of muscle, the physiology of the different types of movement (cytoplasmic streaming, ameboid movement, ciliary movement and muscular contractions; smooth, viscerol and cardiac), and the biochemistry of actin, myosin and A.T.P.

Cell Physiology lacks the clinical orientation that some students prize as the mark of a book's usefulness. It is simply a clearly written, concise, organized presentation of the life-unit as scientists understand it today. Research oriented students will inevitably come to know this book. It has much to offer the clinical student who suffers from a shaky grounding in basic sciences. In short, the book is a welcome addition to any medical student's permanent library.

B.W.P.

The Growth of Medical Thought; L. S. King: University of Chicago Press, 1963; 254 pages; $5.50.

This book is an excellent account of changing medical theory throughout the ages. The author attempts to expose the concepts of medical practice, to analyse the reasons for the premises of medical methodology, and to account for the changes in the explanation of diseases through time. Some theories, though unacceptable in the light of modern advances in medical science, had sound and logical support in time of incomplete and sketchy medical knowledge.

Against a background of Greek mythology, Dr. King traces the transition of medical thought from religion to science. Hippocrates, the father of medicine, by employing careful observations and reason, made medicine a science. The growth of scientific medicine in the Roman era was facilitated by Galen: by keen observation, good experiments, and reasoning by analogies, he was able to establish an advanced medical methodology. An analysis of the Renaissance period, an era of Neo Platonism, shows the refutation of and scorn for Galenistic theories by dynamic and rebellious humanists like Paracelsus. For explanations of biological phenomena and diseases, Paracelsus turned to magic, alchemy and astrology. In the 17th and 18th centuries, the concepts of Paracelsus, founded on abstract principles, gave way to concrete doctrines created by the growth of empiricism, the development of a mechanistic attitude and the formulation of the modern scientific method. Contributions of Vesalius, Harvey and Hoffman are pointed out. The outstanding work and experiments of Schwann, Rokitansky and Virchow in the 19th century are analysed to show the development of the cell theory which eventually gave way to the 20th century molecular concept of disease.

In this study, the author vividly points out that theories relying on terms such as "vital action" and "conjunction of soul and body" offer no insight for making advances in the field of medicine. However, he makes a plea for modern critics not to criticize unjustly the methodology of the empirical scientific method. It was solely the result of their unique ability and insight to unify many isolated observations and to indicate their over-all interrelationship that modern medical methodology arose. It is this ability of consolidating data, and by logical inferences building up reasonable and coherent theories which draws the admiration of the author. Furthermore, he points out that to criticize the views of our ancestors as silly makes the critics the fools.

A.G.L.

Orthopedic Surgery in Toronto

*W. Robert Harris**

Present day orthopedic surgery embraces the very wide field of congenital and acquired lesions of the musculo-skeletal system. Because these problems often produce extensive crippling, orthopedic surgeons more than any other specialists, are not only involved in surgical treatment, but also in the practical problems of rehabilitation. In addition to physical restoration this includes vocational re-training, for often the damage to the patient's locomotor system is so extensive that he must be taught a completely new occupation.

While the problems of crippling diseases are as old as the history of man, the present concept of the specialty originated in 1741, when Nicolas Andry, Professor of Medicine in the University of Paris, published a book on the prevention of deformities in children. Andry coined the word Orthopaedia (Greek: straight, child) for its title. (A copy is in the rare book collection of the Toronto Academy of Medicine). Very rapidly the term "orthopedics" was accepted as meaning that branch of medicine that dealt with crippling disease, whether in a child or adult. Within a century, great skill had been developed in managing deformities of the skeleton by means of cleverly designed braces and splints. This has been aptly termed the "strap and buckle" era of the specialty.

By the end of the 19th century, however, all this was to change. The introduction of anesthesia and antiseptic surgery revolutionized orthopedics. Bow legs could be corrected immediately by open osteotomy instead of prolonged bracing. Damaged joints could be rapidly fused by means of bone grafts instead of endless immobilization in plaster. The wood-like nature of bone enabled it to be sawn, hammered and chiselled at will and many surgeons with a bent for carpentry felt most at home in this field. Indeed, Albee, the great American orthopedist, was formerly a cabinet maker, and introduced many orthopedic procedures that remain standard to this day.

By the early 1900's, orthopedic surgery had become a well established specialty, and despite the overlap with other surgical fields, particularly in the management of trauma, most medical centres on this continent had separate orthopedic services staffed by surgeons who confined their practices to musculo-skeletal problems. Today, in Great Britain and the United States, all stages of fracture management are handled by orthopedic surgeons. Canada lags behind in this respect partly because until recently our relatively sparse population obliged the most surgeons to be "all things to all men".

**W. Robert Harris*
Division of Orthopedic Surgery
Toronto General Hospital

ORTHOPEDIC SURGERY IN TORONTO

1900 to World War I

At the turn of the century there were no surgeons associated with the faculty of Medicine who confined their practice to orthopedic surgery and orthopedic problems were handled by the general surgeons. Because most crippling diseases begin in childhood, it is not surprising that the majority of surgical patients at the Hospital for Sick Children was orthopedic in nature, mostly tuberculosis of bones and joints. Thus the story of orthopedics in Toronto really begins at the Children's Hospital. During the late 1800's one B.E. McKenzie was in charge of orthopedics at that institution, but he left to form a private orthopedic hospital which subsequently merged with the East General Hospital to form the present day Toronto East General and Orthopedic Hospital. His place was taken in 1895 by Dr. Clarence Leslie Starr who, while a general surgeon, was given charge of the orthopedic clinic.

During these early years Dr. Starr developed a world wide reputation for his treatment of bone and joint infection; the principles he laid down for the early drainage of acute osteomyelitis are accepted to this day. Dr. Starr became chief surgeon at the Hospital for Sick Children in 1911. By that time he had been joined on the staff by his former student, Dr. William Edward Gallie. It is of interest that each of these men was to become Professor of Surgery in the University of Toronto. Their combined influence fostered the concept that orthopedics should be a branch of general surgery, and no doubt this has been a major factor in the relatively tardy independance of the specialty in the Toronto area.

W. E. Gallie rapidly established himself as an expert in bone surgery, and by the beginning of the first World War had published several papers on Pott's disease, tendon fixation in the correction of deformities in poliomyelitis, and a classic research on the history of a bone graft. In 1915, Starr went overseas and became officer in charge of surgery at the

Granville Canadian Special Hospital at Ramsgate. Upon his return home in 1917 he was orthopedic consultant to the Canadian Army. He at once set about the establishment of the Dominion Orthopedic Hospital, which occupied a disused factory on Christie Street in Toronto. For a time, all Canadian soldiers with orthopedic problems were assessed at this centre. Subsequently it became the famous Christie Street Hospital for Veterans, which continued until 1947 when it was replaced by Sunnybrook Hospital. Among its staff were Gordon Dale, Robert I. Harris, Arthur Lemesurier and D. E. Robertson. Under Starr's influence, these men developed an interest in orthopedic problems, and with the exception of Gordon Dale, (who remained at Christie Street Hospital as the full time director of its orthopedic service), each of them was appointed to the Hospital for Sick Children when Dr. Starr resumed his appointment as chief surgeon in 1920. Perhaps the most important contribution of the hospital was the development of an artificial limb department (to which Dale and Lemesurier were the consultants). To-day the Prosthetic Services Department of the DVA has an international reputation for its original contributions in the field of prosthetics.

Between the Wars: 1920 to 1940.

C. L. Starr was appointed Professor of Surgery in 1921. Gallie succeeded him as surgeon in chief at the Children's Hospital. The years from then until 1929, when Gallie became Professor of Surgery, were marked by a most exciting outpouring of original work. Even though the contributors were practising as general surgeons, they produced more orthopedic papers than many purely orthopedic centres, and gave Toronto a world-wide reputation in orthopedic surgery. Gallie and Robertson published classic research papers on the repair of fractures and the transplantation of bone. With Lemesurier, Gallie completed a series of investigations on the use of fascia lata as a free transplant to form a "living suture". While this has its greatest application in the repair of herniae, it has many orthopedic applications, notably in the reconstruction of damaged ligaments. Robertson completed an ingenious experiment which proved that bacteria in the circulation tended to settle in the metaphyses of growing bones; this provided an important clue in our understanding of the pathogenesis of hemotogenous osteomyelitis. Harris wrote extensively on orthpedic tuberculosis and on the pathogenesis of septic arthritis. He also became interested in the clinical observation that conditions that produced chronic hyperemia produce over-growth of bones. The fact that the artificial hyperemia produced by lumbar sympathectomy also caused over-growth of limbs stimulated Harris and J. L. MacDonald to investigate the value of sympathectomy in the management of limbs shortened by poliomyelitis: Eventually Harris was able to show that sympathectomy does reduce the limb-length discrepency in this problem. This dry recital of facts does not reflect the intensely exciting era these surgeons lived in. The author has had the privilege of being taught by several of these men; it is quite evident that Gallie's warm personality was the catalyst that stimulated their activity.

When Gallie became Professor of Surgery in 1929, he left the Children's Hospital to become surgeon in chief at the Toronto General Hospital, and persuaded Harris to join him on the general surgical staff of that institution. Dr. Gallie then devoted himself to the establishment of a postgraduate training programme in surgery. While this course was designed to train general surgeons, Gallie's predominant interest in orthopedics gave most of the early graduates a more than adequate background in this field as well. While Harris continued to practise as a general surgeon, his interests became more confined to orthopedics, and he published papers on the internal fixation of hip fractures, on open reduction of fractures of the os ealcis, and a new technique for arthrodesis of the hip. During this period, Dr. D. W. Gordon Murray added to Toronto's orthopedic reputation by his contributions on intramedullary wiring for fractures of the clavicle, and bone grafting for non-union of the carpal scaphoid.

Although no teaching hospital had a separate orthopedic service during the thirties, Drs. Israel Shapiro and Stuart Wright were probably the only surgeons in the city who confined their practice to the specialty. The former was an attendant surgeon at the Mt. Sinai Hospital, while the latter had an out-patient appointment at the Toronto Western Hospital. A land mark was reached in 1940 when the Toronto General Hospital beeame the first of the teaching hospitals to organize a separate orthopedic service. Dr. R. I. Harris was appointed its first chief and Dr. Frederick P. Dewar was chosen as his assistant. The development of the unit was interrupted by the war, as both Harris and Dewar went on active service. Dr. Warren Stoddart accepted an interim appointment as assistant to the division during the war, and did yeoman service towards keeping the infant alive and well during those difficult times.

1945-1963.

After the war, the Orthopedic Service at the General Hospital expanded rapidly. Drs. D. L. MacIntosh, Ian Macnab and W. K. Harris have been added to

the staff. Until 1960, the division shared Ward C with what is now the cardiovascular division. With the rebuilding of the old surgical wing now completed, 1963 will see the orthopedic service installed for the first time in its own geographic area on the remodeled Ward C. Dr. Dewar succeeded Dr. Harris as chief of the service in 1951, and following in the Gallie tradition has established a postgraduate orthopedic training programme that is generally accepted as one of the best on the continent. At the Children's Hospital, Dr. William T. Mustard, a contemporary of Dr. Dewar's was particularly interested in orthopedics and did much to lay the ground work for a separate department there before he became chief of the cardio-vascular unit. Eventually, separate orthopedic services were established at the Hospital for Sick Children in 1956 under Dr. Robert B. Salter, at the Toronto Western Hospital in 1957 under Dr. A. W. M. White, and at St. Michael's Hospital in in 1960 under Dr. Paul McGoey.

As was true after the first war, the influx of wounded veterans created another area of orthopedic interest. The Christie Street Unit, where Dr. Gordon Dale was still the chief, was rejoined by Dr. R. I. Harris who became chief civilian consultant. Drs. George Pennal, Herbert Coleman and James Bateman were appointed as consultants. Each of these had completed orthopedic training before the war outside of Toronto; the former two in Great Britain, the latter in the United States. Each of them has done a great deal towards establishing orthopedics as a separate specialty in Toronto. Dr Pennal is now the surgeon in chief at St. Joseph's Hospital; Dr. Coleman is on the orthopedic service at the Toronto East General and Orthopedic Hospital, and Dr. Bateman has organized and become chief of the Toronto Orthopedic and Arthritic Hospital, the first institution of its kind in Canada. Today, orthopedics is well established in Toronto, and every hospital in the city has an adequate orthopedic service staffed by highly trained men. Original contributions by these orthopedic surgeons in both the clinical and research fields have continued, with the result that Toronto has a well-deserved reputation as one of the world's leading centres in this field. With the rapid expansion of our country the future of orthopedics is limitless, and graduates who choose to enter this field will be assured a rich and rewarding life.

A PRESCRIPTION PHARMACY DESIGNED TO MEET THE PHYSICIAN'S PROFESSIONAL NEEDS

OSBORNE'S PHARMACY

M. R. OSBORNE, Phm, B.

Ground Floor, Medical Arts Bldg. WA. 2-2156

Our Dispensary is Open From 8:30 a.m. Until Midnight Daily

Cardiovascular Surgery

*James A. Key**

"Paracentesis of pericardium is an operation which some surgeons would term a prostitution of the surgical art . . ."

"The patient's temperature reached 30°C. The superior and inferior vena cavae were totally occluded and complete circulatory arrest was produced. After three or four beats the heart emptied itself of blood. The right atrium was opened and by direct vision a small atrial septal defect was closed by means of a continuous running suture. A clamp was then placed across the incision in the right atrial wall, the tapes around the superior and inferior vena cavae loosened and the circulation restarted. During the entire procedure the heart continued to beat slowly but regularly . . ."

The first quotation is from a statement made by one of the world's greatest surgeons — Theodore Billroth. The second is from an operation record at the Toronto General Hospital. Little more than fifty years separate the two quotations. It is not surprising therefore that cardiovascular surgery should have been recognized as an independent specialty only in relatively recent times as superstitions about the danger of operating on the heart took a long time to die and the mere contemplation of surgical procedures on this "delicate" organ were for a long time considered frankly unethical.

In fact the great advances in cardiovascular surgery really date from the era of the Second World War and the years following it. It is pleasant to record that many Toronto surgeons were in the van of this amazing advance in the art and practice of cardiovascular surgery. Unfortunately, space does not permit mention of all of them.

A special tribute must be made to Dr. Gordon Murray who was and still is one of the true pioneers in this field. His original contributions are too numerous to mention but they range from the earliest operations for mitral stenosis and pulmonary stenosis, "blue baby" operations, the first careful clinical application and appraisal of the properties of heparin in patients with thrombophlebitis, the use of autogenous vein grafts to replace arteries and of homologous aortic valves for the relief of aortic regurgitation.

**James A. Key*
Division of Cardiovascular Surgery
Toronto General Hospital

Dr. W. G. Bigelow is another true pioneer in cardiovascular surgery and his original research in the field of hypothermia literally opened the doors to the modern techniques of open-heart surgery.

It is no small tribute to these two men to realize that every open-heart procedure done in the world today utilizes heparinisation and hypothermia.

Dr. R. O. Heimbecker was the first heart surgeon to replace a destroyed mitral valve with a homologous aortic valve.

Dr. W. T. Mustard, in addition to being co-author of the section on cardiovascular surgery in a leading textbook of paediatric surgery, has done much pioneer heart surgery in infants. He was probably the first surgeon to ligate the patent ductus in an infant in heart failure and the first to operate successfully on preductal coarctation of the aorta in infancy.

Also from this school have come some of the most careful clinical studies of such subjects as the effects of surgery on the natural history of mitral stenosis and the long-term results of vascular prostheses and many more.

MEANING OF CARDIOVASCULAR SURGERY

It means the surgical treatment of congenital and acquired lesions of the heart and great vessels. It may involve operations on infants a few days old or on adults in the final decades of life. It means operations which are virtually standardised, relatively simple to do and with a mortality in the range of 1 or 2 per cent such as closure of a patent ductus or opening of a mitral valve. It means operations at the other end of the scale which are long, difficult and with a mortality as high as 50 per cent as in the case of ruptured abdominal aneurysms.

Cardiovascular surgery in children concerns itself mainly with attempts to correct or alleviate congenital abnormalities of the heart or major vessels such as closure of interatrial or inter-ventricular septal defects or of a patent ductus arteriosus, the creation of systemic pulmonary shunts (Blalock operation) for obstructive lesions of the right side of the heart or attempts to correct anomalous pulmonary venous drainage.

In the case of adults about half the surgery is cardiac and the other half involves operations on major arteries or veins. The majority of heart operations are

aimed at the correction or alleviation of acquired valvular disease such as mitral stenosis or regurgitation, aortic stenosis or regurgitation or tricuspid stenosis.

The surgery of major arteries is directed mainly towards the relief of ischaemia resulting from obliterative vascular disease and thus involves attempts to save limbs in the case of blockage of the aorta, iliac or femoral arteries or life in the case of blockage of the coronary arteries. Operations in such cases consist of excision and replacement or the by-passing of blocked segments of arteries. In the case of aneurysms these are removed and replaced usually by artificial prostheses of teflon or dacron.

Two other common vascular operations are the removal of arterial emboli and the diversion of blood from the portal system to the systemic venous system as is done in porto-caval anastamosis for the relief of portal hypertension and bleeding oesophageal varices.

PRESENT STATUS

Cardiac Surgery.

At one end of the scale certain heart operations are relatively standardised and give good results such as mitral stenosis, atrial septal defect, certain types of mitral regurgitation and aoric regurgitation.

At the other end of the scale such conditions as mixed or multivalvular lesions or anomalous pulmonary venous drainage cannot be effectively and safely treated with our present state of knowledge and available techniques.

There is little doubt that better and safer solutions will be found, and the continued probe and search for such solutions has been one of the greatest attractions of this young specialty.

Vascular Surgery.

The surgery of occlusions of large vessels such as the aorta, iliac, femoral, renal or carotid arteries gives excellent results in terms of reasonably long palliation. As we do not know the true cause of arteriosclerosis such results are inevitably influenced by progression of the underlying disease progress.

The elective removal of a threatening aneurysm such as occurs in the abdominal aorta is now a fairly standardised procedure with low risk and high success rate. The mere fact that such a lesion was uniformly fatal some 12 years ago bears eloquent testimony to the spectacular advances in vascular surgery.

The surgery of occlusions of small vessels — in particular the coronary arteries has still a long way to go.

Whereas the results of porto-caval or spleno-renal shunts are good, there has been little progress to date on any large scale in veno-venous shunts or by-passes partly because the conditions which give rise to major venous occlusions such as occur in the superior or inferior vena cava are often incurable malignancy.

TOMORROWS HOPES

In no other branch of surgery is there such a close and necessitous link between the actual treatment of patients and the pursuit of clinical and laboratory investigation. Most cardiovascular patients need a careful and often complex pre-operative assessment and as far as possible all surgical techniques are worked out in the laboratory. If certain surgical procedures give disappointing results then the whole project may have to go back to the laboratory for revision. Furthermore, the advances in cardiovascular surgery are so swift that no unit can claim to be even keeping abreast of the times unless it has good clinical and laboratory facilities, and any unit which wants to keep in the van of progress, must devote as much time and energy as possible to original research.

Some of the cardiovascular research projects already under way in Toronto are: improvements in the techniques of total cardiac by-pass, partial cardiac by-pass in coronary shock, cardiac failure in infants, the etiology of fibroelastosis, improved vascular prostheses, total replacement of diseased heart valves with homologous valves, oxygen therapy in the ischaemic limbs, the extension of hypothermia to permit complicated open-heart surgery and the clinical use and evaluation of cancer perfusion.

We are really only scratching the surface of the potentialities of safe, prolonged open-heart surgery on the pump. The whole problem of total valve replacement for irreperably destroyed valves is still in its infancy. The problems of prolonged heart-pump perfusion are by no means solved. But each year shows ground steadily gained. Probably all operations on the heart in the future will be open-heart procedures.

The whole field of assisting cardiac output by increasing its rate with electrical pacemakers or reducing the load on the heart in coronary shock by partial left heart by-pass, is still wide open to further research and clinical application.

The perfection of arterial prosthesis, the behaviour and acceptance of homograft valves or other tissues, cancer perfusion, total organ transplantation, the unsolved problems of thrombophlebitis — these are but a few of the projects awaiting further research by young cardiovascular surgeons.

It would be a very grave omission, in discussing the past, present and future scope of cardiovascular surgery, if due tribute were not paid to the band of skilled workers who have kept pace with the cardiovascular surgeons — the cardiologists and internists, the anaesthetists, the biochemists, the pump technicians and a select group of devoted and highly trained nurses but for whose expert skill and care many of the major cardiovascular procedures we now do routinely, would have died in embryo. Nevertheless, if unsolved problems are any indication of the expansion and further development of a specialty — and I think they are — then cardiovascular surgery does have a wide future.

WHAT ATTRIBUTES

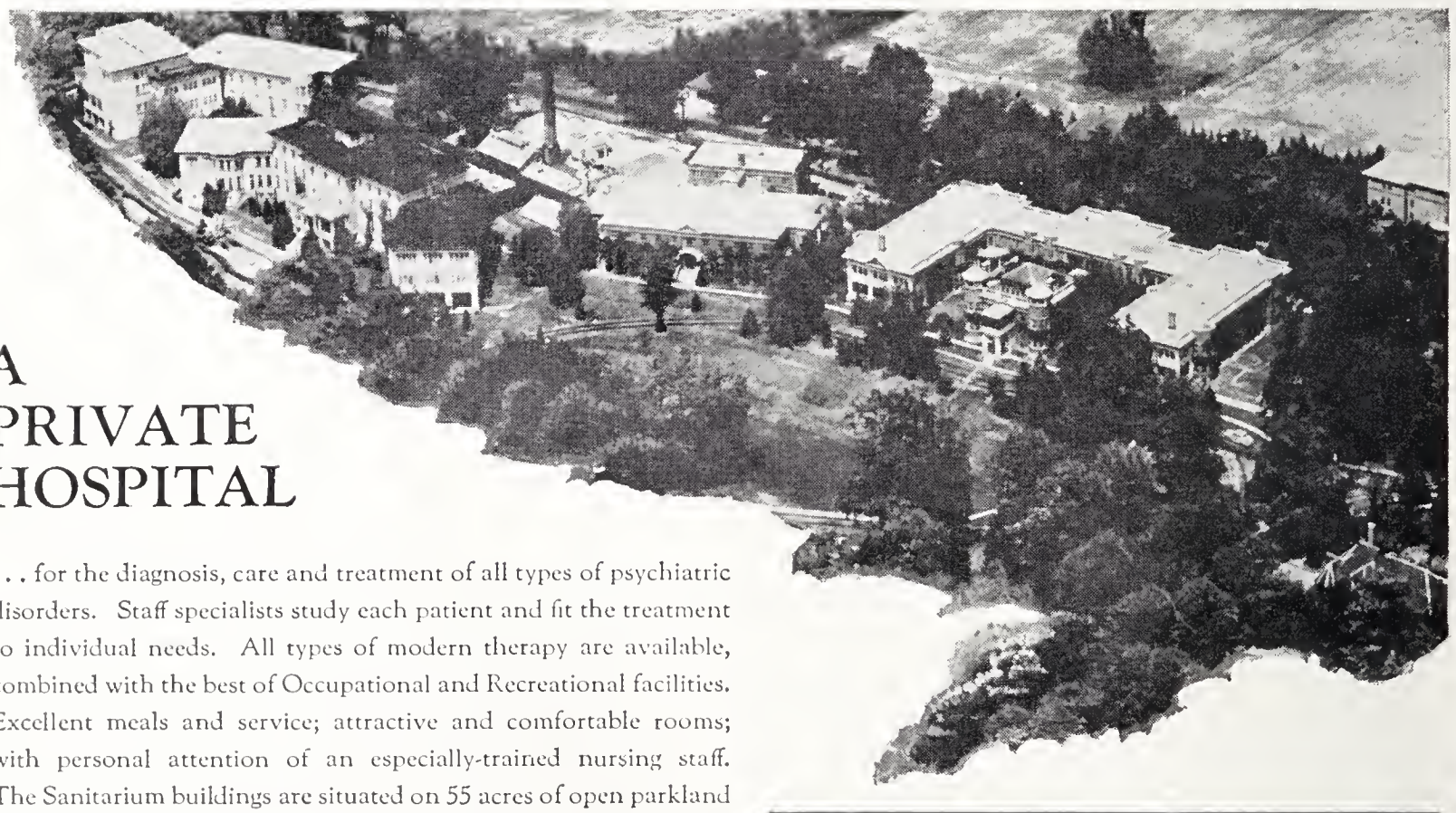
There are probably few specialized attributes which a cardiovascular surgeon should possess relative to those of other surgeons but there are perhaps some which are worthy of comment.

He must be able to accept and live with continuing high risk surgery, often in relatively young people, since many of the signposts pointing to operability or non-operability in certain cardiovascular conditions have yet to be clearly defined.

He must be a good team worker. A surgeon can no longer "go it alone" in cardiovascular surgery. He must be willing to pass on his experience to younger men to spare them the anxieties and disappointments which inevitably burden someone who is exploring a new field.

He must be physically fit as many cardiovascular procedures are long and tiring. He must be dedicated to basic and clinical research.

Perhaps in fifty years a surgeon with a good pair of hands may be able to undertake cardiovascular surgery with the knowledge that most of the techniques are standardised and relatively simple of execution and the signposts of success and disaster clearly defined — but certainly this is far from the truth at the present time and thus makes this young and vigorous specialty so challenging and satisfying.



A
PRIVATE
HOSPITAL

. . . for the diagnosis, care and treatment of all types of psychiatric disorders. Staff specialists study each patient and fit the treatment to individual needs. All types of modern therapy are available, combined with the best of Occupational and Recreational facilities. Excellent meals and service; attractive and comfortable rooms; with personal attention of an especially-trained nursing staff. The Sanitarium buildings are situated on 55 acres of open parkland in the City of Guelph.

Benefits, under Ontario Hospital Insurance and other plans, are available to patients—the extent thereof depending on the nature of the illness and other factors. For full information write, or telephone TAylor 4-1010.

G. S. BURTON, M.D.C.M., *Medical Superintendent.*

HOMEWOOD
SANITARIUM

GUELPH, ONTARIO

General Surgery in Toronto

*J. E. Mullens**

The term general surgery has, at the moment, no precise definition; the specialty is in a period of transition, and the term has different meanings to different people. General surgery in a small to moderate sized community embraces elements of orthopedics, neurosurgery, plastic surgery, urology, gynecology and gastroenterology. In some university centres it comprises gastroenterology, and thoracic surgery; in others — notably in Britain — it is gastroenterology and urology. And to the layman the term 'general surgeon' sometimes means one who practises surgery with no particular distinction. All surgery was general surgery in the beginning, but the passage of time, the development of special fields of interest, and the refinement of specialized techniques, led to the splitting off of various surgical specialties, and it is because modern surgery is so young (about one hundred years in age) that this evolutionary branching is still evident, with various states of differentiation existing in different regions, depending upon the local requirements and surgical evironment.

YESTERDAY

Over the last 70 years or so, since the development of aseptic surgery, Toronto has had many distinguished practitioners of general surgery. Some of the outstanding men are considered briefly here. Professor George Peters (1859-1907), a man of varied interests and talents, was one of the first surgeons to transplant the ureters into the intestine, and gave us "Peter's sign" — the transmission of heart sounds through the abdomen of the patient suffering from peritonitis. He also was one of the first to practise aseptic surgery in this area. Unfortunately he died at the age of 48, and his genius was lost before it had made all the contributions expected of it. F.N.G. Starr (1867-1934) was one of the first surgeons to perform esophago-gastrectomy. Although Sir William MacEwen of Edinburg was the first surgeon to perform pneumonectomy in 1895, Norman Shenstone and Robert Janes of Toronto were pioneers in lung surgery and were among the first surgeons to develop pulmonary surgery on this continent in the early 1930's. Their development of the hilar tourniquet allowed the operation to be put on a sound anatomical basis. Professor C. L. Starr revitalized the department of surgery when he took office in 1921; he was known internationally for his concept of the pathogenesis of osteomyelitis. In 1929 Roscoe Graham was the first to successfully remove an insulin secreting tumor of the pancreas. This master surgeon also made many other contributions, notably to the management of perforated duodenal ulcer and rectal prolapse. Carcinoma of the cervical esophagus was the special interest of Harold Wookey; he modified Trotter's technique of surgical management, and the operation has since been known by his name. One of the fathers of cardiovascular surgery is a brilliant general surgeon, Gordon Murray. His interest in vascular surgery grew out of his original research on heparin. In addition to his ingenious contributions to this field he wrote important articles on the management of certain fractures, on kidney transplantation, and invented one of the first artificial kidneys. The late W. E. Gallie, in collaboration with A. B. Lemesurier, first described the use of fascia lata as living suture material; the technique has been found to be specially useful in the repair of large herniae. Gallie was primarily an orthopedic surgeon, and his contributions to this sphere of surgery are best discussed elsewhere, but perhaps his most significant contribution to Canadian surgery was his idea of a formal course of postgraduate training in surgery. Up to his time no Canadian teaching center had developed an organized program for the training of surgeons, a concept which seems quite commonplace now. It would be safe to say that he profoundly influenced the whole development of surgery in this country with his training scheme. Our present Professor of Surgery, F. G. Kergin, was the first to perform intrapleural replacement of the esophagus with a segment of colon in 1952; he pointed out the advantages of the colon over the jejunum for this procedure.

GENERAL SURGERY TODAY

General surgery is still diversified, but it has become less general than it used to be. There is a trend or tendency in this center, and perhaps more so in others, for general surgeons to limit their interests to the alimentary tract and it embryological derivatives, the thoracic cavity, and some affections of the extremities and breasts. While some centers have developed thoracic and cardiovascular surgery as one specialty, in our own hospitals they have tended to remain separate, thoracic surgery remaining in the field of general surgery to a large extent. Many general surgeons continue to be actively interested in the

**J. E. Mullens*
Department of Surgery
Wellesley Hospital, Toronto

treatment of fractures, although this practice differs from some localities where orthopedic surgeons have assumed the care of these injuries. British surgeons are as surprised to hear that we still treat fractures, as we are to hear that they still practise urology.

There are particular reasons why general surgery has evolved in this manner in Canada. Our population is thinly spread over a wide area, and if people in a small community are to receive expert surgical care they must have locally available a surgeon of wide and varied skills, otherwise they would have to travel long distances to reach an area where they could find all the surgical specialties. This is impractical, and, due to the efforts of those centers training general surgeons, there are now few communities that lack the services of a well trained surgeon. The emphasis on the training of surgeons of catholic abilities has led the general surgeon of this city to conduct a more varied practice than his colleagues in United States or Britain. And yet, the interests of the university general surgeons here are predominately gastro-intestinal or thoracic, and the general surgical research projects underway reflect the interests and practice in Toronto.

RESEARCH TODAY

Investigations into the pathogenesis of pancreatitis are now being carried out in the Banting Institute. In collaboration with the Ontario Veterinary College, studies are in progress on ulcerative colitis and Crohn's disease, which are also diseases of obscure origin. One of the general surgeons interested in thoracic surgery is conducting experiments in tracheal reconstruction. Another group has been investigating the phenomenon of cancer cells in the circulating blood, and the cytology of sputum in cigarette smokers. One surgeon is studying the effect of radiation on intestinal enzymatic activity. Another, in co-operation with physicians, is investigating methods of intestinal dialysis to treat kidney failure. There is great scope for research in general surgery. Some of man's most disabling and enigmatic diseases affect the gastrointestinal tract. Peptic ulcer, diseases of the pancreas and gall bladder, Crohn's disease, and ulcerative colitis, and many others require more original research to elicit their pathogenesis. The development of tissue transplant basic knowledge and techniques is a fertile field for exploitation by general surgeons. These and other projects might be under study now but for the difficulties imposed by limited space, and to some extent by lack of funds. We may look forward to having better facilities and support in the future when benevolent groups, lay societies, and the public at large are made aware of the need for encouragement of research of this type.

TOMORROW

There will always be a need for the general surgeon — in the truest sense of the term — in Canada. As far as we can predict, the smaller communities will present diverse surgical problems, and the surgeons practising in such places will have to have a working knowledge of the most common surgical affections of the body without regard to arbitrary boundaries set by the surgical specialties. The training centers for many years to come will have to continue to send out men equipped to fill this role. A particular need exists for well trained general surgeons to treat the serious multiple injury cases resulting from automobile accidents; such cases present challenging problems, and occur wherever there are highways. Since the last war the volume of surgeons completing their training has been sufficient to almost fill the need that existed. Good general surgeons, however, are still required, and the training of them will continue, in order to fill the remaining vacant posts, and to replace those retiring, dying or limiting their work to the surgical specialties. We may expect this general training to be accomplished by the trainee rotating through a series of surgical specialty units in the teaching hospitals.

In the larger cities, and especially in the university centers, the general surgeon is likely to increasingly restrict his activities to the digestive tract, its environs, and the thorax. A new name will have to be coined for this surgeon, for the term 'general surgeon' will not be quite appropriate. Perhaps he will call himself an alimentary surgeon, a thoraco-abdominal surgeon, or simply 'surgeon' — unspecified. It is likely that he will become more closely allied with his colleagues, the physicians; the trend is even now apparent. The artificial barriers that have stood between the physician and surgeon for centuries have been undergoing dissolution over the last few decades as the surgeon is becoming more of a physician, and the physician finds this closer association stimulating and rewarding. It is becoming increasingly common to see treatment and investigative units formed of both physicians and surgeons together in some of the large university centers. Not only does this apply to gastroenterology, but to respiratory diseases, cardiovascular diseases, neurological disorders, and others. It is natural for those interested in the same field to share their knowledge and experience, and to pool their skill; indeed, it seems to be the most fruitful way of treating disease. Funds to support research, full-time fellows, skilled technicians, and para-medical help are more readily available to those who concentrate their interests to a specific field or disease. To appreciate this fact one needs only to witness the monies that have been col-

lected to support research in angiocardiology, rheumatology, oncology, poliomyelitis, and others; compare the strides that have been taken in these fields with those that have been made in gastroenterology over the last two decades.

This same gregariousness that will affect the university surgeon has already begun to affect the surgeon outside the university area. It seems reasonable to predict that the general surgeon of the future will practise in a group of physicians and surgeons. This type of association is becoming more popular, and has much to recommend it. The patterns of practice may change but the general surgeon of the future will have to have the same qualities he has had for the last 600 years. "First he should be learned; second he should be expert; third he must be ingenious, and fourth, he should be able to adapt himself" — Guy de Chauliac (1300-1370).

Abstracts

Hypercalcemia: *The Diagnostic Spectrum,* Am. J. Med., Vol. 33, July 1962.

At Duke University, in perplexing diagnostic problems, serum calcium levels are assessed. Hypercalcemia may have a varied etiology:

1. **Primary hyperthyroidism**
2. **Vitamin D intoxication**
3. **Boeck's sarcoid**
4. **Idiopathic hypercalcemia of pregnancy.**
5. **Milk-Alkali Syndrome (patients taking milk and alkali for peptic ulcer therapy over long periods of time).**
6. **Thyrotoxicosis (abates after anti-thyroid therapy).**
7. **Atrophy of bone due to disuse.**
8. **Steroid withdrawl syndrome (postoperatively following subtotal removal of adrenals in treatment of Cushing's disease, or following high levels of exogenous steroid therapy).**
9. **Malignancy (especially with breast, lung, and kidney carcinoma, which have a peculiar predilection for bone metastases).**
10. **Hodgkin's, lymphoma, leukemia, and multiple myeloma.**
11. **Secondary hyperthyroidism in longstanding renal disease (with osteitis fibrosa cystica).**

Symptoms include: arthralgia and arthritis, cachexia, psychiatric disorders, G.I. complaints, stasis ulcer of legs, and multiple system involvement.

A Sample Case history is given. A 64 year old white woman presented with migratory bone pain, nocturia, constipation, malaise, weakness and anorexia. On physical examination there was no bone tenderness but slight liver enlargement and diffuse demineralization of ribs were noticed. Serum calcium was 16.3 mg.%. Rib biopsy showed a metastatic bronchogenic carcinoma. It is thought that carcinomatous metastases to bone can produce a parathyroid-like hormone.

Retrolental Fibroplasia: *Cause and Prevention;* Illinois M.J. 121:565, 1962.

At the time its cause and cure was found in 1952, this condition was blinding over 1,000 infants a year in the United States; the number totally blinded exceeded 7,000. At that time, a study of various nurseries was made. It was shown that an excess of Oxygen removed the stimulus necessary for the orderly growth of blood vessels in the premature infants eye, and that with a supplemental amount of oxygen adequate to maintain life, retrolental fibroplasia of infants weighing less than 2500 Gm. was prevented. The decision to use supplemental oxygen should be based on the clinical indications of each newborn, the concentration should never exceed 50%, and administration of oxygen should be periodic rather than continuous and should be discontinued as early as possible.

Otosclerosis: constitutional signs; Cesko. Otolaryngol. 10:145-152, 1961.

Heredity was investigated in 262 patients with otosclerosis, and hereditary factors were proved in 38%. The more frequent incidence of heredity from the maternal side is in agreement with the more frequent incidence of otosclerosis in women in general. Younger children in the family suffered more frequently from otosclerosis than older children. A family history of alcoholism and mental disease was found in 3%.

From a total of 274 operated patients, women were 3.35 times more frequent than men. Otosclerosis was more frequent in persons with black hair. The pigmentation of the skin and iris did not differ markedly as compared with a control group. Blue sclerae were found in 13.3%, bone fractures in 15.5%. The first pregnancy reduced hearing in 26.4%, the second pregnancy in 43.9%, and subsequent pregnancies in 52%. Reduced hearing occurred usually after childbirth, sometimes in the course of pregnancy, and rarely during lactation or after abortion.

F. Langer 6T4

reminder to medical students:

S-M-A PHYSICIANS' SERVICE

S-M-A is available to physicians, internes and senior medical students — without charge—for the feeding of their own infants. We would like you to observe the superiority of the S-M-A formula in the nutrition of the most important infant in the whole world — your baby.

Thousands of doctors across Canada have taken advantage of this service through the years — years that have brought constant improvement in the S-M-A formula. Today, S-M-A contains all the elements necessary to produce nutritional results surpassed only by mother's milk.

Sound Infant Nutrition **S-M-A** *Powder, or Concentrated Liquid*

Simply contact your Wyeth Representative or write to

Sales Service Department **JOHN WYETH & BROTHER (CANADA) LIMITED** **Windsor, Ontario**

Medical Horizons

MEDICINE IN TANGANYIKA 1962

Dr. Russ Manuel, a Toronto graduate of 1957 interned at Charity Hospital in New Orleans. After taking a course in Tropical Medicine in England, he spent two years in Tanganyika, working most of the time in a rural outpost hospital. He is now working towards his D.P.H.

Tanganyika is a former U.N. trusteeship territory situated in East Africa. It is closely linked to Uganda and Kenya through the East African Common Services Organization. With a population of about nine million people, Tanganyika is one of the poorest of Africa's countries and depends mainly on agriculture for its income. The medical services are provided mainly by the government, but also by various missions.

In the capital, Dar es Salaam, there is a large, modern, well-equipped hospital to which a newly arrived foreign doctor is usually posted at first. This stay permits him to gain experience in tropical diseases and to have an opportunity to do some surgery which he will most certainly be called upon to do when he is posted "up country". The hospital is provided with most of the specialists. As it draws the more difficult cases from all over the country as well as the routine cases from the capital itself, it provides a great variety of medicine and surgery.

There are four or five other large regional hospitals (about 200 to 300 beds) in the country, which have four or so doctors attached to them and, if available, a qualified surgeon as well. These hospitals deal with the routine medical needs of the surrounding area as well as with cases (particularly surgical) of more difficulty from a larger area. The bulk of the medical needs however, are met by smaller district hospitals, usually with sixty beds and one doctor.

In the whole country there is approximately one doctor to 20,000 people so that in the rural areas the ratio is much greater. It is common for one doctor to supervise a sixty bed hospital as well as the complete medical needs of 100,000 people in the surrounding district. Most of the treatment is therefore not provided by doctors: even at one of the sixty-bed hospitals the bulk of the patients are seen and treated by medical assistants who have three years training in a special school. They soon get a very broad experience in most branches of medicine under the guidance of the doctor in charge of the hospital. The medical assistants refer patients to the doctor, and the doctor may also see all patients with certain diagnoses such as tuberculosis, leprosy and those requiring surgery.

The doctor does a considerable amount of emergency surgery because most of this cannot be turned over to less well trained assistants. The commonest surgical emergencies are obstetrical cases requiring forceps or Caesarians, incarcerated inguinal hernias, fractures and other results of trauma. Frequently the doctor sees things he has not seen before or has forgotten how to treat. He must then consult his texts or go back to first principles and improvise as best he can.

Another of the responsibilities of the physician is to visit the smaller outpatient clinics scattered throughout his district. He does this to advise the rural medical aids (who have two years training in diagnosing and treating minor conditions), and to see for himself some of the medical problems which do not reach the hospital.

There is no sharp dividing line between preventative and curative medicine in this situation because one doctor is concerned with all the medical needs of the population. When there are so few doctors and other trained personnel it is impossible to hope to provide all the curative services that are needed: preventative medicine would therefore seem to be more important. The physician soon sees that if he can somehow avoid some of the immediate pressures of curative medicine and devote at least part of his time to organizing preventative measures, that his efforts will be of greater ultimate good to the people he is serving.

The demands of the practice of medicine in rural Africa may seem too much for a recent medical graduate, but somehow things seem to work out. Once in the situation, one sees that there are many people with poorer training who are having to meet the same demands.

F. R. Manuel, M.D.

Trichobezoars

Wayne Furlong 6T4

The term "bezoar" originates from either an Arabic ("badzehr") or a Persian ("padzahr") root meaning antidote or counterpoison. In modern medicine "bezoar" describes a mass found in the stomach and composed of accumulated ingested material. In ancient times these concretions from the stomachs of men and animals were believed to be blessed with magical properties to cure illness and wounds. Organized medicine's first recorded interest in the bezoar is found in a treatise on the bezoar stone from the pen of that learned Persian physician, Ispahan Imad-ul-Dim (1520-1600 A.D.). So highly prized was this stone, and so universally revered as a remedy that a bezoar was listed among the crown jewels of Queen Elizabeth. In 1582 a unique service was established; those who could not afford to buy a bezoar could rent one by the day. In the same year Lonicer set down the three criteria by which one would distinguish a true magic bezoar from a non-magic pseudobezoar: a red hot needle pierced into a bezoar stone would produce no smoke; powder made from the stone would cure a poisoned man or beast; the stone mixed with saliva would discolour a cloth. Such superstition died a slow death and in the mid-eighteenth century the bezoar stone was still included in the London pharmacopeia: "The dose for one bitten, poisoned, or stung is the weight of twelve barley grains; the dose for weakness and loss of sexual power is one grain."

Pathology

Lacking the reverence of the ancients, we may classify human bezoars by composition.

Trichobezoars are hairballs or hair-casts of the stomach. This variety constitutes over fifty percent of such concretions, and occurs predominantly in the first two decades of life. It is largely a pediatric condition. Ninety-two percent of trichobezoars occur in females.

Phytobezoars are composed of fruit and vegetable fibres. The distribution tends to be the converse of that of the first species. Seventy percent occur in males over thirty years. The chief offender is the persimmon fruit, a plum-like fruit growing in various parts of North America. The typical history is that a hungry hunter finds a grove of these edibles somewhere in the wilderness and the persimmon debauche which follows produces a bezoar.

Trichophytobezoars, obviously a mixture, are very rare.

Rare concretions occurring in children consist of shellac, varnish, glue or nails.

Among children the trichobezoar is by far the commonest variety, and the remainder of it is concerned solely with the trichobezoar. The trichobezoar is a large quantity of hair firmly matted together and frequently completely filling the stomach so that it assumes a "J" shape. They vary greatly depending on the amount and duration of trichophagia (G. thrix — hair, phagein — to eat). The largest recorded trichobezoar, to my knowledge, was ten pounds on removal. Although there is usually a single mass of hair firmly matted together, sometimes a number of hair-balls may be found joined to each other by faceted surfaces.

The bezoar is coated with a glairy, slimy, mucoid substance, and encrusting it interspersed in it are bits of partially digested food. The result is that an extremely foul, nauseating odour emanates from a fresh trichobezoar. Regardless of the patient's hair colour the hair-ball is green-brown or black: this is generally attributed to the action of gastric juices and sulfides on the ingested hair of a blond person. Since horse's, cow's, and goat's hair have all, on occasion, been observed in human trichobezoars, there is room for speculation.

Etiology

A hair cast of the stomach is the result of trichophagia — the eating of hair, usually the patient's own hair. Very young children place in their mouths and swallow an endless variety of foreign bodies, most of which pass into the stomach, and hair is not immune to this Jonah-and-the whale treatment. However, in all but the youngest children, trichophagia is related to psychiatric disturbances. Reasons given by children for their hair eating habits have included the following: "To clean the tongue", "To make the voice clear", "Because it is so nice", and because the patient liked the tickling sensation as the hair made its way down to the stomach. Some authors have related the fact that some cat species are reputed to commit suicide by eating their own hair, and the fact that older patients with trichobezoars have given this as a reason for their habit. One thirty-one year old man is recorded as tying some of his hair to a rope and swalling the rope and hair in the belief that this would cure his ailments. Whatever the case there is some underlying psychiatric defect in older children and adults and it is probably related to the various perverse appetites found

in grossly insane persons. On psychiatric examination other expressions of personality maladjustment are found including nail-biting, eneuresis, nightmares, tics or habit disorders.

The long hair of girls is generally considered to be the explanation for the ninety-two percent female majority in hair-swallowing; it is simply easier. In young girls there is usually an association with a trichobezoar, an active constant habit pattern of placing the hair between the teeth, biting, and swallowing. The hair strands, upon reaching the stomach, become attached and retained in the folds of gastric mucosa as there is insufficient frictional surface on the strand of hair for it to be propelled along as is the food. Once the hair mass is of sufficient size to prevent free passage through the pylorus it grows by accretion, enmeshing further hair.

Sometimes small hair-balls are caught up by the peristaltic movements and are passed in the stool. Should the hair-cast not be passed but continue to grow, it may after years give rise to clinical manifestations.

Clinical Features

Frequently the trichobezoar is present five, ten or fifteen years before symptoms occur. During this period the patient's general health is unimpaired. Eventually there will be malaise, indigestion, vague upper abdominal pains, a sensation of heaviness in the epigastrium and perhaps intermittent vomiting. Progressive intolerance to solid food, but not to liquids, and weight loss may occur. A history of trichophagia is virtually never given spontaneously by the patient, and parents of children with hair-eating habits are loath to tell of it. Eventually there may be paroxysms of nausea, vomiting, epigastric pain, headaches, hematemesis and insomnia. In general the symptoms are vague and extremely variable.

On examination the patient is usually a pale, nervous, emotionally disturbed child with a malodorous breath. She may be undernourished and restless. Pulse and respiration are normal except during a paroxysm of pain. A large, firm, tender, extremely mobile, and well-defined, smooth mass may be felt in the epigastrium. The "J" shape may be noticeable. Above all, hair may be deficient in the frontal and temporal regions.

Complication which may occur include obstruction, ulceration, hemorrhage, perforation and peritonitis.

Investigation and Treatment

There may be a slight secondary anemia, a leukocytosis, a low (often normal) gastric acidity, probably related to a chronic gastritis due to irritation or bits of hair in stool. Final diagnosis is by barium swallow and X-ray or fluoroscopy. With fluoroscopy in the erect position, the trapped barium enters the cardia, hesitates momentarily, then flows down the greater and lesser curvatures outlining a non-opaque foreign body in the stomach. This foreign body can be demonstrated to be freely mobile. The outlined stomach is normal in contour but increased in size. There is no evidence of peristalsis. Barium collects in the antrum. Six hours later there is sufficient barium clinging to the bezoar to outline the stomach.

Treatment consists of two parts. First, operative removal of the bezoar through a gastrotomy is performed. Psychiatric treatment is of equal importance since the fundamental cause is a mental disturbance, and neglect of the latter aspect of treatment may result in a recurrence of the bezoar, reinforced and strengthened with hospital mattress stuffings before the patient has left the hospital.

REFERENCES

1. Debakery: Surgery; 4; 934-936 Dec. 1938
2. Debakery: Surgery; 5; 132-160 Jan. 1939
3. Delia C. W.: Phytobezoars: Arch. Surgery April 61: 82: 579
4. Hurwitz and MacAlenney: Trichobezoar in Children (Rev.): AMA J. Dis. Child; 81:733-761 June 1951

IF . . . you enjoy reading the up-to-date review articles and the imaginative features in the University of Toronto Medical Journal —

THEN renew your subscription right away. $4.50 plus exchange will give you another year of surprises in student medical journalism.

As a special prize to new internes, the Journal is offering a two year subscription to members of the class of 6T3 for this same low price.

UNIVERSITY OF TORONTO MEDICAL JOURNAL,
Circulation Manager,
Room 114, Medical Building,
Toronto, Canada.

Please enter my name as a subscriber for 1963-64
☐ Renewal ☐ New Subscription
☐ $4.50 is enclosed (cheques payable to University of Toronto Medical Journal)

Name . . . . . .

Address . . . . . .

. . . . . .

☐ I am in 6T3. Let my subscription run 2 years

Answers to On Inspection

Questions — page 225

FIGURE 1: Craniosynostosis

Synostosis, or prematural closure of sutures, can give rise to variations in the shape of the skull. The type of variation that occurs depends on what suture(s) closes prematurely. For example, premature closure of the sagittal suture causes an elongated skull, a condition refered to as scaphocephaly.

Early operation providing artificial suture lines is important in order to prevent irreversible brain damage.

FIGURE 2: Ileostomy

This is an operative procedure which is carried out for conditions affecting the large bowel, and occasionally the terminal ileum, and in which the internal oval sphincter cannot be spared. The commonest conditions necessitating such an operation are idiopathic ulcerative colitis, tumours of the rectosigmoid area, injury to the large bowl, and atresia of the terminal ileum.

The operation consists of bringing ileum to the abdominal wall; a plastic disposal container is placed over the bowel to receive the faces.

Now, turn back to the picture. This time observe the clothing carefully. Note that ileostomy opening has not been placed too low to interfere with the panty belt nor has it been placed too high to interfere with the bra strap (The latter would be a very unlikely occurrence).

FIGURE 3: Internal Hemorrhoids (Prolapsed)

This condition results from hypertrophy, elongation, and dilatation of the internal hemorrhoidal plexus of veins, with their consequent prolapse.

Characteristically (and if you look closely you can actually count them) there are three such hemorrhoids, occurring at 3, 7, and 11 o'clock.

The treatment is essentially surgical. The hemorrhoids are excised.

FIGURE 4: Keloid

This is an elevated mass of redundant connective tissue covered with epidermis which occasionally grows at the site of an incision or wound. Certain individuals have a predisposition for this overgrowth of tissue in wound healing. The abberation is related to the constitution of the host rather than to the etiology of the wound.

Excision & skin grafting followed by early irradiation appear to be the most effective treatment.

I would like to take this opportunity to thank the photography departments of the teaching hospitals for their generous assistance, Jim Graham for his patience and praise, Don Armitage for his constant cajoles, and last but not least, the students for their cutting, but sometimes kind, comments. So ends my venture into journalism.

S. M. Zweig 6T3

This Journal is published six times a year from November to April, by the Medical Society of the University of Toronto, to serve primarily as a medium for student expression.

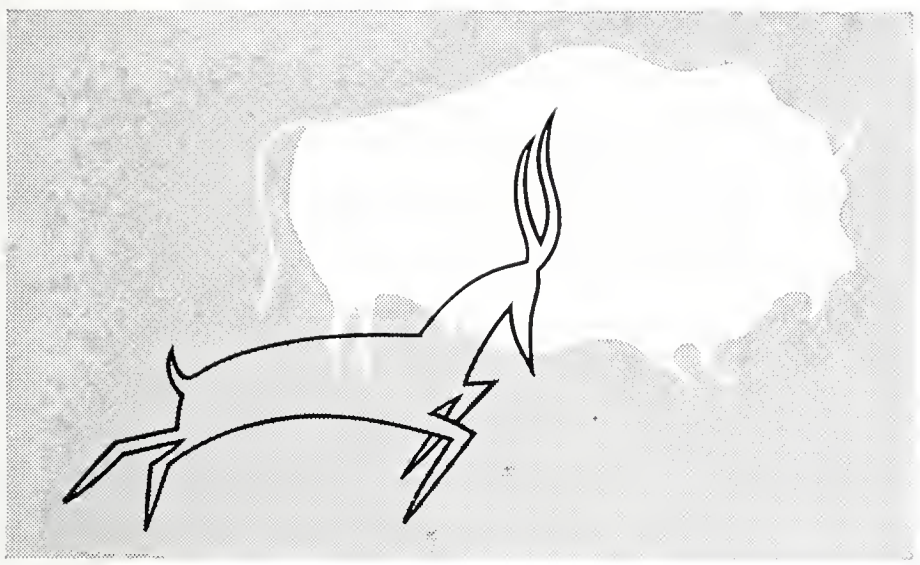
Subscription rates: $4.50 for one volume of six consecutive issues. Single copies, $1.00.

Manuscripts including references and footnotes should be typewritten double spaced on one side of the paper. Aricles should not exceed 3,000 words. *Final Copy Date* is the 15th two months prior to issue. Mailing date is the 15th of the month of issue. Material printed in this Journal is covered by copyright. Papers are accepted for consideration with the understanding that they are contributed for publication in this Journal only.

Correspondence should be addressed to: Room 114, Medical Building, University of Toronto, Toronto 5, Canada.

Authorized as second class mail by the Post Office Department, Ottawa, and for payment of postage in cash.

Printers: General Printers, Oshawa, Ontario.



d'après création Ateliers A. B. C. - Paris

APPETITE MODERATOR

ACTION ON THE PSYCHE

In obesity...

LIDEPRAN

phacetoperane

- free from toxicity
- virtually no untoward side-effects
- non habit-forming

TABLETS OF 5 MG AND 20 MG

Information and samples upon request

Poulenc LIMITED

8580 ESPLANADE, MONTREAL 11

INDIVIDUALIZED RELIEF FOR PAIN OF VARYING SEVERITY AND ETIOLOGY

"222" TABLETS (white) contains: ⅛ gr. Codeine phosphate

Ⓝ **"282" TABLETS** (yellow) contains: ¼ gr. Codeine phosphate

Ⓝ **"292" TABLETS** (pink) contains: ½ gr. Codeine phosphate

C — Acetylsalicylic acid 3½ gr.
Phenacetin . . . . . 2½ gr.
Caffeine citrate . . ½ gr.

Ⓝ Telephone narcotic prescription permitted.

Dosage: One or two tablets as required.
Packaged as per your prescription.

Charles E. Frosst & Co.
MONTREAL CANADA